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Radar, Frequency, Pulse Width, Pulse Repetition Interval, Instantaneous Frequency Measurement, software.

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

This report was a followup to, Collection and Analysis of Specific ELINT Signal Parameters, DTIC #A166507, 23 Jun 85. The programs and hardware assembled for the above mentioned report were used to analyze two types of radars, the PPS-6 and the HOOD radars. The typical ELINT parameters of frequency, pulse width, and pulse repetition rate were collected and analyzed.

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UAA-016

U.S. ARMY INTELLIGENCE CENTER AND SCHOOL
Software Analysis and Management System

Collection and Analysis of Specific Elint Signal Parameters: Final Report

Technical Memorandum No. 8

December 9, 1985

by

Dr. Lonnie A. Wilson

Concur:

James W. Gillis, Subgroup Leader
Algorithm Analysis Subgroup
USAMS Task Team

John Radbill, Manager
USAMS Task Team

J. P. McClure, Manager
Ground Data Systems Section

Peter Gray, Acting Manager
Communications and Data
Systems Development Subprogram

JET PROPULSION LABORATORY
California Institute of Technology
Pasadena, California

JPL D-2787

PREFACE

The work described in this publication was sponsored by the United States Army Intelligence Center and School. The writing and publication of this paper was supported by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration, NAS 7-918, RE 182, A187.

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INTRODUCTION

This contract is for the development of test configurations and supporting software to facilitate the collection and analysis of specific ELINT signal parameters. The fixed price research and development contract is being performed by Electonic Systems under JPL Contract No. 957176, Modification No.1.

Mr. James Gillis and Dr. Lonnie Wilson met on 8 August 1985 to initiate and coordinate the details of contract No. 957176, Modification No. 1. This early meeting satisfies the preliminary oral briefing requirement by Electronic Systems. The interim report was submitted and reviewed on September 20, 1985. This final report is submitted on September 27, 1985. The Statement of Work section of this report is a direct reproduction of Article 1, revised Statement of Work of the modified contract. In addition to the collection and analysis included in the SOW, Electronic Systems agreed to perform third and fourth central moment calculations and 25 through 75 interprecentile range calculations.

The following tasks have been completed and analysis results are being reported in the report:

1. The single pulse ELINT Parameter Measurement Processor has been assembled.
2. Data collection software has been written and debugged.
3. Frequency, pulsewidth and PRI sampled data have been collected on two radars.
4. Data processing and analysis software has been updated for all statistical and histogram analysis.
5. Statistical and histogram analysis have been performed on frequency, pulsewidth, and PRI sampled data.

JPL

Jet Propulsion Laboratory
California Institute of Technology
4800 Oak Grove Drive
Pasadena, California 91109

SUPPLEMENTAL AGREEMENT
STATEMENT OF WORK

CONTRACT NO.	MODIFICATION NO.	TASK ORDER NO.	PAGE NO.	NO. OF PAGES
957176	1	RE182/A187	1	3

TO: (CONTRACTOR'S NAME AND ADDRESS)	ISSUED BY
ELECTRONIC SYSTEMS 22560 Murietta Road Salinas, CA 93908	JET PROPULSION LABORATORY CALIFORNIA INSTITUTE OF TECHNOLOGY 4800 OAK GROVE DRIVE PASADENA, CALIFORNIA 91109

THE ABOVE NUMBERED CONTRACT IS MODIFIED AS FOLLOWS:

1. ARTICLE 1, STATEMENT OF WORK, is revised as follows:

(a) Add paragraph (a)(3) as follows:

(3) Perform the following additional tasks on two (2) radar systems:

(A) Develop and test data collection software for ELINT data (frequency and pulsewidth parameters) with the Instantaneous Frequency Measurement (IFM) sensor.

(B) Perform data collection and signal processing analysis using the IFM sensor for frequency and pulsewidth parameters.

(C) Perform statistical analysis of the sampled data collected with the IFM sensor. Sampled data plots, histograms, and statistical analysis will be performed for each of the two (2) radar systems.

(D) Upon completion of the tasks described in paragraphs (a)(3)(A) through (a)(3)(C) on one radar system, the decision to perform the tasks on the second system will be based on the interim test results from the first system.

(b) Add paragraphs (b)(4) and (b)(5) as follows:

(4) Provide oral and written preliminary and interim reports describing the proposed method of analysis and the analysis used on each radar system.

(5) Provide an overall final oral and written report analyzing the overall results from this additional work.

EXCEPT AS HEREBY MODIFIED, ALL TERMS AND CONDITIONS OF SAID CONTRACT AS HERETOFORE MODIFIED REMAIN UNCHANGED AND IN FULL FORCE AND EFFECT.

NAME OF CONTRACTOR	CALIFORNIA INSTITUTE OF TECHNOLOGY
ELECTRONIC SYSTEMS	
SIGNATURE BY Lonnie A. Wilson	DATE 7/18/85
AUTHORIZED SIGNATURE	DATE
TYPED NAME Lonnie A. Wilson	TYPED NAME
TITLE President	TITLE

(c) Delete paragraph (c)(1) and substitute:

(1) Three (3) copies of an interim written report describing the results of the work performed under paragraphs (a)(2) and (a)(3).

(d) Add paragraph (d)(6) as follows:

(6) Decide whether or not to proceed with performing the tasks on the second radar system within five (5) working days after receipt of the interim results from the first radar system.

2. ARTICLE 2, DELIVERY OR PERFORMANCE SCHEDULE, is revised as follows:

(a) Delete paragraphs (c)(1) and (c)(6) and substitute:

(1) Collect and analyze ELINT signal parametrics as specified in paragraph (a)(2) and perform the additional tasks described in paragraph (a)(3)	Date of Contract through September 30, 1985.
(6) Final written report summarizing all work as specified in paragraph (c)(2)	Delivered.

(b) Add paragraphs (c)(7) and (c)(8) as follows:

(7) Interim written report describing the results of the additional tasks as specified in paragraph (b)(4)	August 30, 1985
(8) Final written report describing the results of the additional tasks as specified in paragraph (b)(5)	September 30, 1985

ELINT PARAMETER MEASUREMENT PROCESSOR

IFM (Instantaneous Frequency Measurement) and RF Electronic Counter sensors were employed to measure, collect, and analyze ELINT signal parameters associated with an AN/PPS-6 radar and the Hood radar. These actual ELINT or Electronic Support Measures (ESM) sensors with an accompanying RF to IF downconverter have been employed by several platforms to measure precision frequency and precision PRI parameters.

The complete ELINT sensor system employed for data collection and analysis under this modified contract is shown in figure 1. The RF/IF downconverter converts the RF input signal to an IF signal at approximately 410 MHz. The wideband downconverter was specifically designed not to color the signal waveform.

The IFM and HP 5345A Electronic Counter sensors were used to collect and measure the ELINT parameters. The data collection, statistical data processing, and histogram software programs were written on the HP-85 microcomputer. Floppy discs are used to store data sets and results are plotted using the HP-7470A plotter.

The software programs developed for this analysis are:

1. GETVAL Program - This program is used to collect data with the RF Electronic Counter sensor.
2. TPLOT Program - The data samples are plotted as a function of time.
3. HPLOT Program - The data collected using GETVAL program can be analyzed in histogram form with this program.

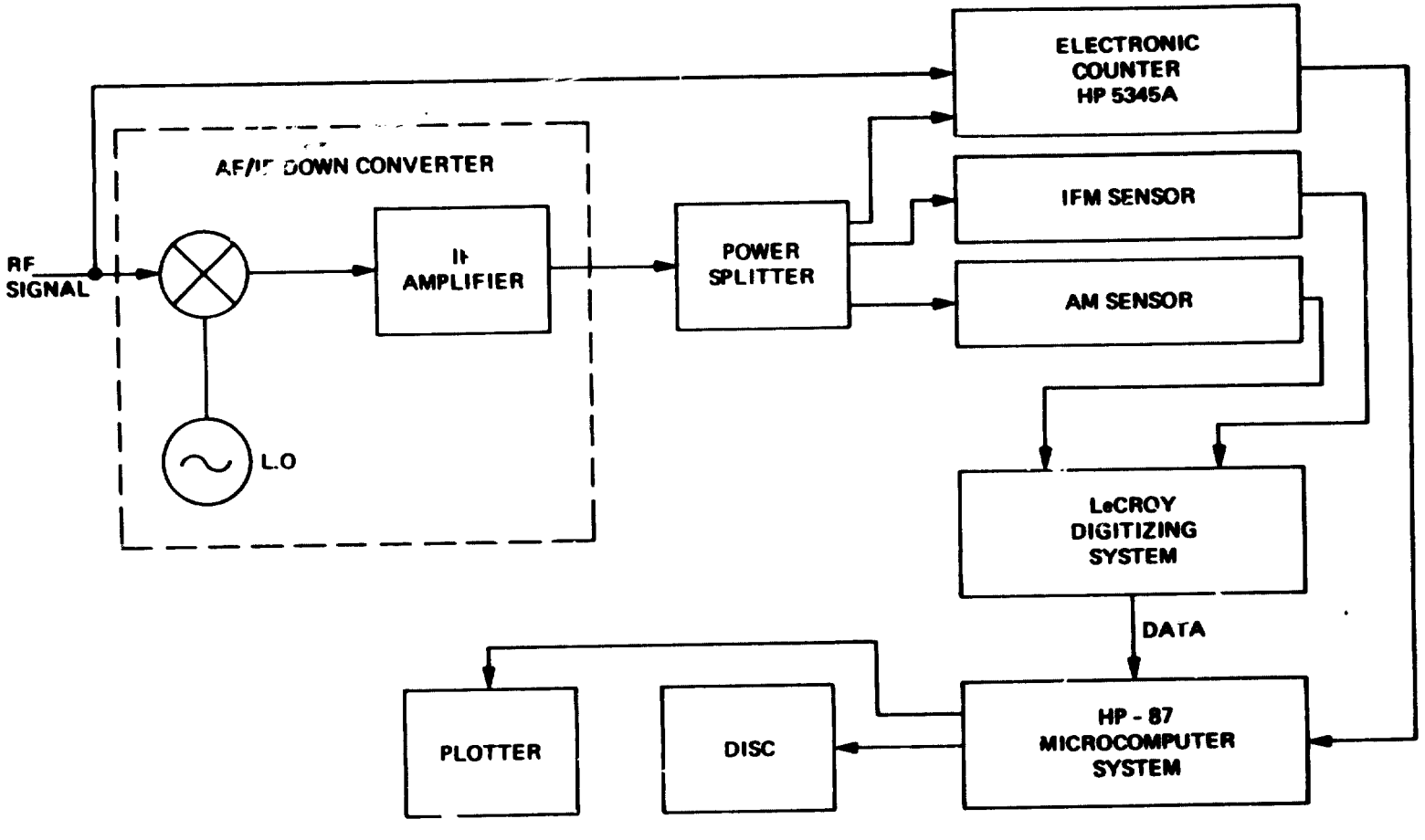


Figure 1. Modified ELINT Parameter Processor Using IFM Sensor and MW Electronic Counter

4. DATAS Program - This program is used to compute the statistical parameters associated with the data.

5. PRINTP Program - This program prints the statistical parameters derived from the DATAS Program.

6. HISTP Program - This program plots the theoretically expected histogram and the measured data histogram on one plot.

7. HCROY and other Programs - These programs allow data collection with the IFM sensor and LeCroy Digitizing System and data transfer to the HP-87 computer system for analysis.

Computer programs 1 through 6 were developed under the original contract, while program 7 was developed under the modified contract. The HCROY program is listed in Appendix A of this report.

ANALYSIS ALGORITHMS

The analysis algorithms used in this modified contract are identical to the algorithms used in the original contract. These algorithms will not be repeated again.

TEST RESULTS

1. HOOD Radar

a. Single Pulse Frequency

Two sets of single pulse frequency sampled data were collected and analyzed for the HOOD radar. The IFM sensor was employed to make these measurements.

Table 1 contains the summary statistical results for this analysis and Appendix B contains a more detailed analysis of the single pulse frequency sampled data.

b. Single Pulse Pulsewidth

Four sets of single pulse pulsewidth sampled data were collected and analyzed for the HOOD radar. The Microwave Counter sensor was employed to make these measurements.

Table 2 contains the summary statistical results for this analysis and Appendix C contains a more detailed analysis of the single pulse pulsewidth sampled data.

c. Single Pulse PRI

Four sets of single pulse (more accurately defined as one pulse to the next pulse) PRI sampled data were collected and analyzed for the HOOD radar. The Microwave Counter sensor was employed to make these measurements.

Table 3 contains the summary statistical results for this analysis and Appendix D contains a more detailed analysis of the single pulse PRI sampled data.

d. **Average Frequency**

Four sets of average frequency sampled data were collected and analyzed for the HOOD radar. The Microwave Counter sensor was employed to make these measurements. Approximately 300 pulses were averaged into one sampled data point.

Table 4 contains the summary statistical results for this analysis and Appendix E contains a more detailed analysis of the average frequency sampled data.

e. **Average Pulsewidth**

Four sets of average pulsewidth sampled data were collected and analyzed for the HOOD radar. The Microwave Counter sensor was employed to make these measurements. Approximately 300 pulses were averaged into one sampled data point.

Table 5 contains the summary statistical results for this analysis and Appendix F contains a more detailed analysis of the average pulsewidth sampled data.

2. PPS-6 RADAR

a. **Single Pulse Frequency**

Two sets of single pulse frequency sampled data were collected and analyzed for the PPS-6 Radar. The IFM sensor was employed to make these measurements.

Table 6 contains the summary statistical results for this analysis and Appendix G contains a more detailed analysis of the single pulse frequency sampled data.

b. **Single Pulse Pulsewidth**

Four sets of single pulse pusewidth sampled data were collected and analyzed for the PPS-6 radar. The Microwave Counter sensor was employed to make these measurements.

Table 7 contains the summary statistical results for this analysis and Appendix H contains a more detailed analysis of the single pulse pulsewidth sampled data.

TABLE ONE

HOOD RADAR

ELINT PARAMETER ANALYSIS - SINGLE PULSE FREQUENCY

STATISTICAL PARAMETER \ DATA SET	P4SNABCD	P4SNEFGH
MEAN VALUE (MHz)	418.49	419.29
MEDIUM VALUE (MHz)	418.49	419.29
DATA RANGE (MHz)	2.57	2.12
STANDARD DEVIATION (MHz)	0.278	0.38
COEFFICIENT OF SKEWNESS	0.32	0.066
COEFFICIENT OF KURTOSIS	3.35	2.69
CHI-SQUARED	95. (9c)	34. (11c)
25 - 75 INTER - PERCENTILE RANGE MHz (approximate)	0.467 (87%)	0.41 (55%)

TABLE TWO

HOOD RADAR

ELINT PARAMETER ANALYSIS - SINGLE PULSE PULSEWIDTH

DATA SET / STATISTICAL PARAMETER	P4SPWA	P4SPWB	P4SPWC	P4SPWD
MEAN VALUE (nsec.)	263.7	263.13	262.79	262.33
MEDIUM VALUE (nsec.)	263.7	263.13	264.79	262.33
DATA RANGE (nsec.)	22.	22.	22.	22.
STANDARD DEVIATION (nsec.)	4.1	4.18	4.02	4.31
COEFFICIENT OF SKEWNESS	-0.69	-0.63	-0.71	-0.55
COEFFICIENT OF KURTOSIS	3.2	3.05	3.14	2.79
CHI-SQUARED	170. (11c)	222. (11c)	203. (11c)	119. (11c)
25 - 75 INTER-PERCENTILE RANGE nsec. (approximate)	4.0 (59%)	6.0 (68%)	6.0 (72%)	6.0 (68%)

TABLE THREE

HOOD RADAR

ELINT PARAMETER ANALYSIS - SINGLE PULSE PRI

DATA SET / STATISTICAL PARAMETER	P4SRRA	P4SRRB	P4SRRC	P4SRRD
MEAN VALUE (μsec.)	222.18	222.18	222.19	222.19
MEDIUM VALUE (μsec.)	222.18	222.18	222.19	222.19
DATA RANGE (μsec.)	0.238	0.244	0.248	0.248
STANDARD DEVIATION (μsec.)	0.037	0.035	0.038	0.039
COEFFICIENT OF SKEWNESS	-0.027	0.21	-0.02	0.20
COEFFICIENT OF KURTOSIS	2.25	2.99	2.66	2.48
CHI-SQUARED	94. (17c)	42. (9c)	53. (19c)	92. (19c)
25 - 75 INTER-PERCENTILE RANGE μsec. (approximate)	0.05(58%)	0.05(75%)	0.05(57%)	0.05(52%)

TABLE FOUR

HOOD RADAR

ELINT PARAMETER ANALYSIS - AVERAGE FREQUENCY

STATISTICAL PARAMETER \ DATA SET	P4RFA	P4RFB	P4RFC	P4RFD
MEAN VALUE (MHz)	14,906.43	15,011.66	15,011.77	15,011.71
MEDIUM VALUE (MHz)	14,906.43	15,011.66	15,011.77	15,011.71
DATA RANGE (MHz)	1.11	0.69	0.41	0.77
STANDARD DEVIATION (MHz)	0.272	0.115	0.08	0.154
COEFFICIENT OF SKEWNESS	-0.12	-0.019	0.213	-0.27
COEFFICIENT OF KURTOSIS	2.19	2.69	2.35	2.17
CHI-SQUARED	362.(9c)	22.4(23c)	50.(13c)	99.(9c)
25 - 75 INTER-PERCENTILE RANGE MHz (approximate)	0.32 (56%)	0.18 (62%)	0.13 (65%)	0.26 (71%)

TABLE FIVE

HOOD RADAR

ELINT PARAMETER ANALYSIS -AVERAGE PULSEWIDTH

STATISTICAL PARAMETER \ DATA SET	P3PWA	P3PW3
MEAN VALUE (nsec.)	224.07	223.48
MEDIUM VALUE (nsec.)	224.07	223.48
DATA RANGE (nsec.)	0.8	0.76
STANDARD DEVIATION (nsec.)	0.138	0.135
COEFFICIENT OF SKEWNESS	0.283	0.34
COEFFIEICNT OF KURTOSIS	2.68	2.67
CHI-SQUARED	36. (9c)	40. (9c)
25 - 75 INTER-PERCENTILE RANGE nsec. (approximate)	0.18(65%)	0.17(65%)

TABLE SIX

PPS-6 RADAR

ELINT PARAMETER ANALYSIS -SINGLE PULSE FREQUENCY

STATISTICAL PARAMETER \ DATA SET	P1SNABCD	P1SNCDEF
MEAN VALUE (MHz)	407.40	407.12
MEDIUM VALUE (MHz)	407.40	407.12
DATA RANGE (MHz)	2.0	1.19
STANDARD DEVIATION (MHz)	0.225	0.172
COEFFICIENT OF SKEWNESS	0.400	0.752
COEFFICIENT OF KURTOSIS	4.43	5.15
CHI-SQUARED	177. (7c)	160. (11c)
25 - 75 INTER-PERCENTILE RANGE MHz (approximate)	0.23(76%)	0.11(58%)

TABLE SEVEN

PPS - 6 RADAR

ELINT PARAMETER ANALYSIS - SINGLE PULSE PULSEWIDTH

STATISTICAL PARAMETER \ DATA SET	P1SPWA	P1SPWB	P1SPWC	P1SPWD
MEAN VALUE (nsec.)	309.4	309.4	309.57	319.04
MEDIAN VALUE (nsec.)	309.4	309.4	309.57	319.04
DATA RANGE (nsec.)	10	10	10	14
STANDARD DEVIATION (nsec.)	1.45	1.39	1.52	2.08
COEFFICIENT OF SKEWNESS	-0.18	-0.24	-0.13	-0.21
COEFFICIENT OF KURTOSIS	3.08	3.16	3.16	3.0
CHI-SQUARED	231.(5c)	263.(5c)	95.(5c)	258.(7c)
25 - 75 INTER PERCENTILE RANGE nsec. (approximate)	2 (85%)	2 (87%)	2 (82%)	2 (68%)

CONCLUSIONS

The following tasks have been completed during this development effort:

1. Data collection software for the IFM ELINT sensor has been completed. Part of the data collection software program is included in Appendix A.

2. Statistical analysis software has been revised and updated.

3. Single pulse frequency, single pulse pulsewidth, single pulse PRI, average frequency and average pulsewidth sampled data have been collected for the HOOD radar using the IFM sensor and the Microwave Counter sensor.

4. Frequency and pulsewidth sampled data have been collected for the AN/PPS-6 radar using the IFM sensor and the Microwave Counter sensor.

5. Statistical analysis of all sampled data have been completed. Summary statistical results are presented in the test results section of this report. Detailed statistical analysis results are presented in Appendix B, C, D, E, F, G, and H of this report.

APPENDIX A

```
10 ! 'HCROY'
20 ! THIS PROGRAM GETS SHORT MESSAGE CONSISTING OF 1 DATA POINT PORT0
30 ! THE HEADER IS DISCARDED, THEN THE DATA POINT IS CONVERTED TO
40 ! FREQUENCY.  THIS IS THEN LOOPED FOR N DATA POINTS--LECROY
50 ! SELF-ANALLYSIS LOOP MUST MATCH THIS LOOP
60 ! 6/4/85       RAG
70 DIM N$[24],B$[78],Y(1001) ! LENGTH OF N$ MUST MATCH # READ CHARACTERS
80 !           TRY TO GET THE FASTEST POSSIBLE BAUD RATE
90 CONTROL 10,3 ; 8 ! BAUD 8=1200 11=2400 13=4800 15=9600
100 CONTROL 10,4 ; 3
110 CONTROL 10,9 ; 5 ! RESET RX QUEUE
120 CONTROL 10,2 ; 0 ! DTR LOW
130 DISP "ENTER NUMBER OF DATA POINTS DESIRED"
140 INPUT N
150 DISP "START DATA"
160 CONTROL 10,9 ; 5
170 FOR J=1 TO N
180 FOR K=1 TO 17 ! GET HEADER AND IGNORE
190 CONTROL 10,2 ; 1 !          DTR ENABLE
200 ENTER 10 ; B$
210 NEXT K
220 CONTROL 10,2 ; 1 !          DTR ENABLE
230 ENTER 10 ; N$ ! GET STRING FROM LECROY
240 Y(J)=VAL (N$[10,15]) ! FIND STRING VALUE-VALUES MAY NEED ADJUSTMENT
250 DISP Y(J)
260 NEXT J
270 SHORT D(1001)
280 D(0)=N
290 DISP "SORTING!"
300 FOR K=1 TO N !       CONVERT CELL ARRAY TO FREQUENCY
310 V=Y(K)*2-256 ! OFFSET TO =-256 MV
320 D(K)=V/1000*92.38+401.2 ! INTERCEPT AND SLOPE TO FREQ ARRAY
330 DISP K,D(K)
340 NEXT K
350 BEEP 200,500 @ DISP "ENTER FILENAME  FILE.VOLUME"
360 INPUT F$
370 CREATE F$,1,N*8+8
380 ASSIGN# 1 TO  F$
390 FOR K=0 TO N
400 PRINT# 1 ; D(K)
410 NEXT K
420 ASSIGN# 1 TO  *
430 BEEP 250,500 @ DISP "DONE"
440 END
```

APPENDIX B

INTRODUCTION

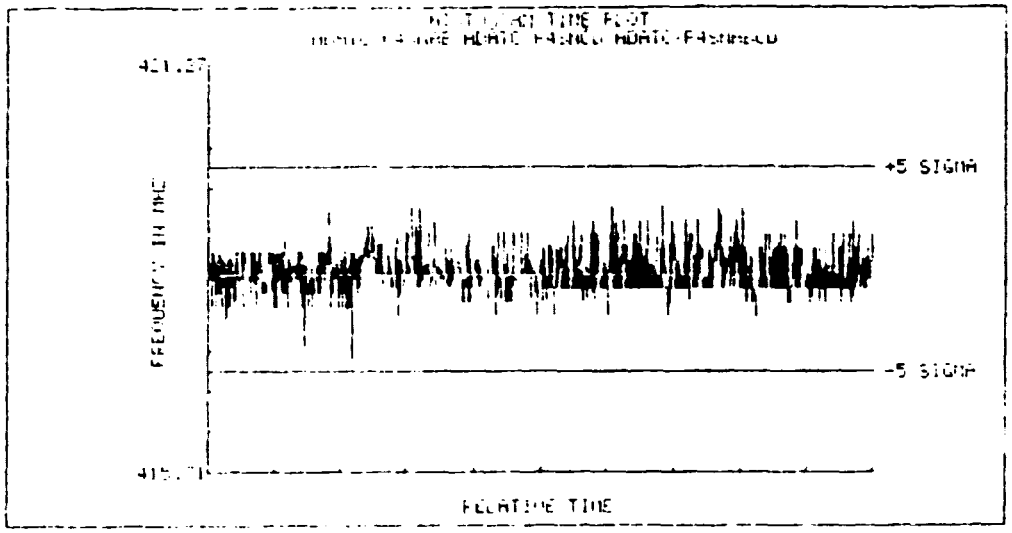
ELINT parameter test results are contained in this appendix for the single pulse frequency parameter associated with the HOOD radar. These measurements were performed with the IFM sensor. The single pulse frequency data sets are labelled P4SNABCD and P4SNEFGH.

Single Pulse Frequency Sampled Data - P4SNABCD

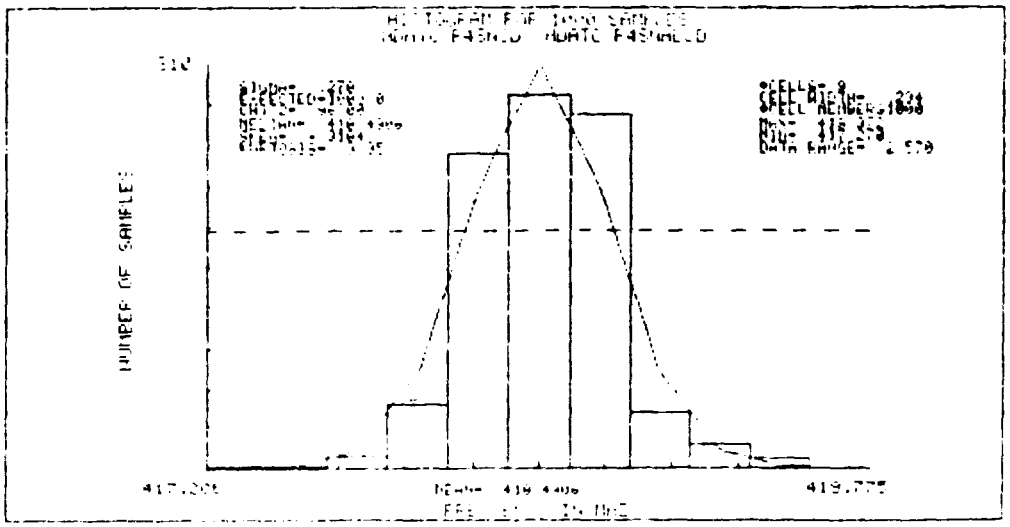
The statistical results of the single pulse frequency sampled data P4SNABCD are presented on the next three pages. Histogram time plots, histograms, and statistical analysis are presented.

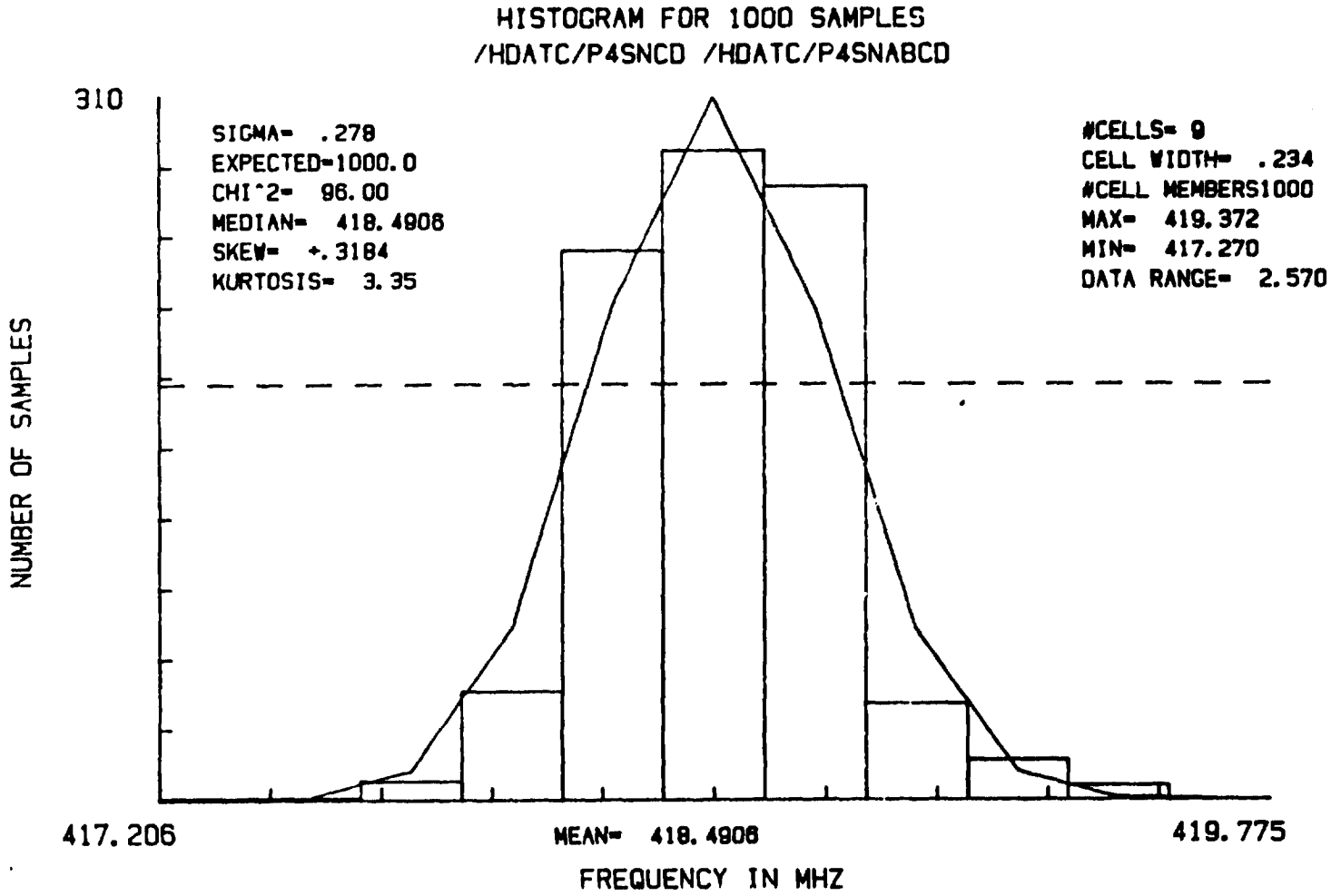
The test results section of this report contains summary statistical information associated with this frequency data set.

FILENAME/HDATC/P4SNAB/HDATC/P4SNCD/HDATC/P4SNABCD
START TIME IS 11:54:59 85/09/14
MEAN= 418.4906
MAX VALUE= 419.3723 MIN VALUE= 417.2700 RANGE= 2.10
SIGMA= .2780
COEFFICENT OF SKEWNESS= +.3184
COEFFICIENT OF KURTOSIS= 3.3486
OUT-OF-RANGE DATA POINTS= 0 POINTS
EXECUTION TIME= 72 SECONDS



HPLOT EXECUTION TIME= 5.08MINUTES.




HISTOGRAM FOR 1000 SAMPLES
/HDATC/P4SNCD /HDATC/P4SNABCD
310
SIGMA= .278
EXPECTED=1000.0
CHI^2= 96.00
MEDIAN= 418.4906
SKEW= +.3184
KURTOSIS= 3.35
#CELLS= 9
CELL WIDTH= .234
#CELL MEMBERS1000
MAX= 419.372
MIN= 417.270
DATA RANGE= 2.570
NUMBER OF SAMPLES
417.206
MEAN= 418.4906
419.775
FREQUENCY IN MHZ

FILE /HDATC/P4SNABCD

PLOT MIN= 417.2058 PLOT MAX= 419.7753
DATA MIN= 417.2700 DATA MAX= 419.3723

CELL #	CENTER	# SAMPLES	EXPECTED
1	417.3226	1	.049
2	417.5562	1	1.180
3	417.7898	9	13.972
4	418.0234	52	81.656
5	418.2570	262	235.517
6	418.4906	310	335.249
7	418.7242	293	235.517
8	418.9577	46	81.656
9	419.1913	19	13.972
10	419.4249	7	1.180
11	419.6585	0	.049

MEAN VALUE= 418.4906
STANDARD DEVIATION= .2780
COEFF OF SKEWNESS= +.3184
COEFF OF KURTOSIS= 3.3486
CHI-SQUARED= 95.9981
MEDIAN X VALUE= 418.4906
CELL WIDTH= .233551
PLOT RANGE= 2.5695
SUM ACTUAL=1000
SUM EXPECTED= 999.9980

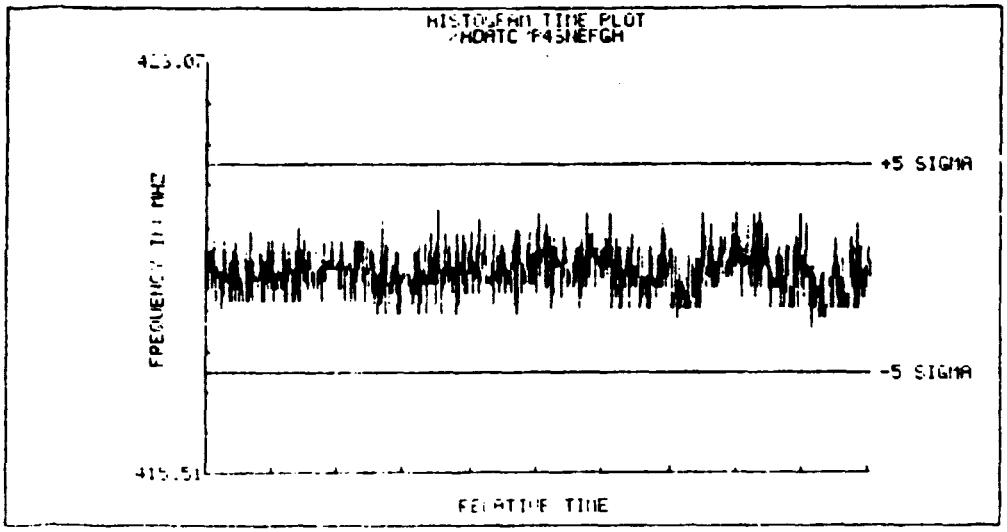
87.1PERCENT OF DATA LIES BETWEEN 418.2570 AND 418.7242

Single Pulse Frequency Sampled Data - P4SNEFGH

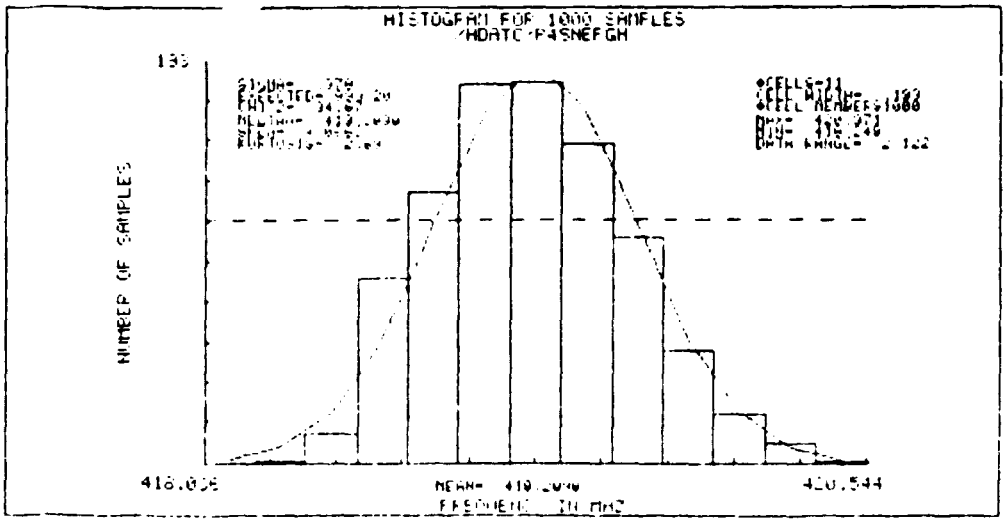
The statistical results of the single pulse frequency sampled data P4SNEFGH are presented on the next three pages. Histogram time plots, histograms, and statistical analysis are presented.

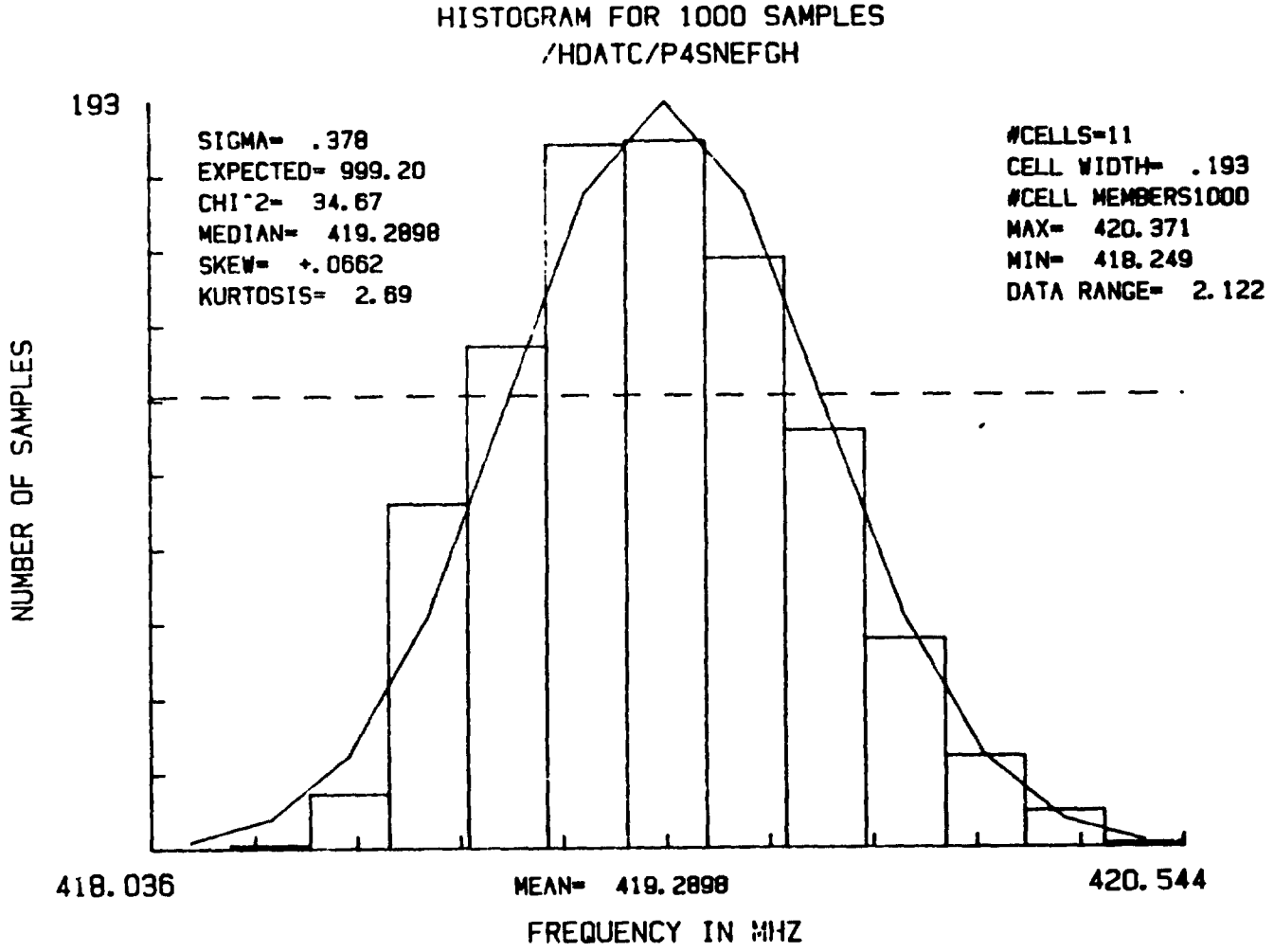
The test results section of this report contains summary statistical information associated with this frequency data set.

FILENAME/HDATC/P4SNEFGH START TIME IS14:19:4385/09/14
MEAN= 419.2898
MAX VALUE= 420.3706 MIN VALUE= 418.2485 RANGE= 2.12
SIGMA= .3779
COEFFICENT OF SKEWNESS= +.0662
COEFFICIENT OF KURTOSIS= 2.6887
OUT-OF-RANGE DATA POINTS= 0 POINTS



IF N1= 5 CW= .4244080000000062
IF N1= 7 CW= .303148571428616
IF N1= 9 CW= .2357022222222257
IF N1= 11 CW= .1929127272727756
IF N1= 13 CW= .16323384615387
IF N1= 15 CW= .1414693333333354
IF N1= 17 CW= .1248258823529S9
IF N1= 19 CW= .11168631578949
IF N1= 21 CW= .1010495238095S9
IF N1= 23 CW= .0927626086956657
IF N1= 25 CW= .0848816000000124
IF N1= 27 CW= .0785940740740856
HPLOT EXECUTION TIME= 5.52MINUTES.




HISTOGRAM FOR 1000 SAMPLES
/HDATC/P4SNEFGH
193
SIGMA= .378
EXPECTED= 999.20
CHI^2= 34.67
MEDIAN= 419.2898
SKEW= +.0662
KURTOSIS= 2.69
#CELLS=11
CELL WIDTH= .193
#CELL MEMBERS1000
MAX= 420.371
MIN= 418.249
DATA RANGE= 2.122
NUMBER OF SAMPLES
418.036
MEAN= 419.2898
420.544
FREQUENCY IN MHZ

FILE /HDATC/P4SNEFGH

PLOT MIN= 418.0359 PLOT MAX= 420.5437
DATA MIN= 418.2485 DATA MAX= 420.3706

CELL #	CENTER	# SAMPLES	EXPECTED
1	418.1323	0	1.870
2	418.3252	1	7.838
3	418.5181	15	25.322
4	418.7111	94	63.039
5	418.9040	137	120.933
6	419.0969	192	178.774
7	419.2898	193	203.654
8	419.4827	161	178.774
9	419.6756	114	120.933
10	419.8685	57	63.039
11	420.0615	25	25.322
12	420.2544	10	7.838
13	420.4473	1	1.870

MEAN VALUE= 419.2898
STANDARD DEVIATION= .3779
COEFF OF SKEWNESS= +.0662
COEFF OF KURTOSIS= 2.6887
CHI-SQUARED= 34.6679
MEDIAN X VALUE= 419.2898
CELL WIDTH= .192913
PLOT RANGE= 2.5079
SUM ACTUAL=1000
SUM EXPECTED= 999.2038
55.2PERCENT OF DATA LIES BETWEEN 419.0969 AND 419.4827

APPENDIX C

INTRODUCTION

ELINT parameter test results are contained in this appendix for the single pulse pulsewidth parameter associated with the HOOD radar. These measurements were performed with the Microwave Counter sensor in the single pulse measurement mode of operation. The single pulse pulsewidth data sets are labelled:

P4SPWA

P4SPWB

P4SPWC

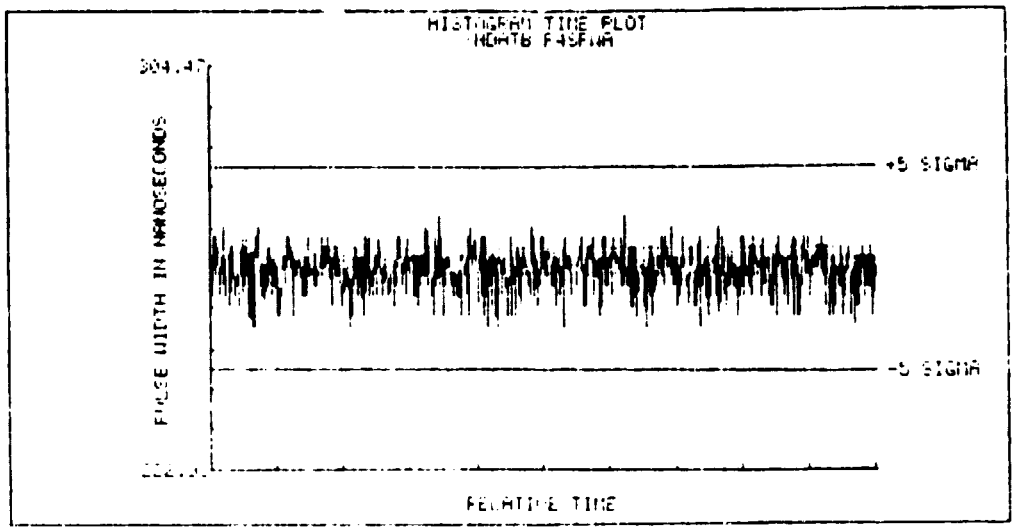
P4SPWD

Single Pulse Pulsewidth Sampled Data - P4SPWA

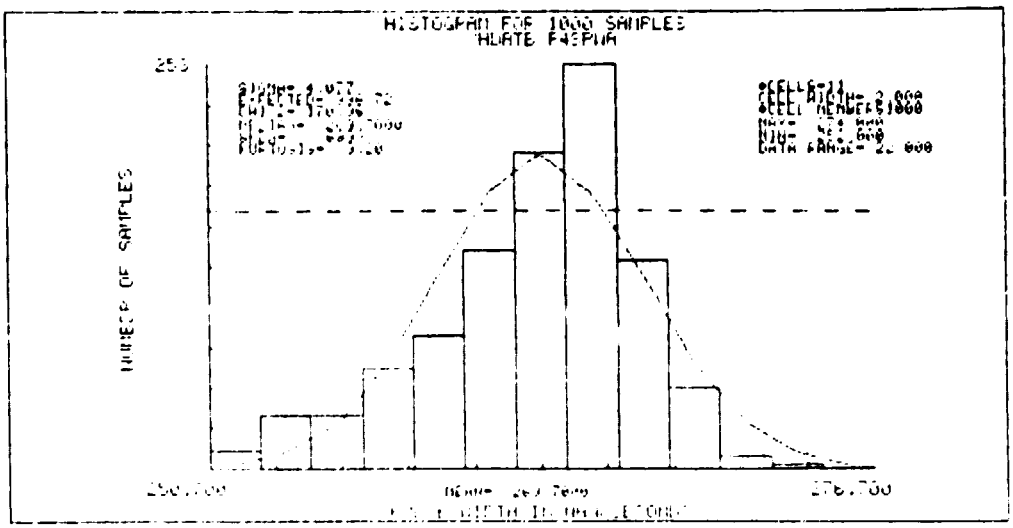
The statistical results of the single pulse pulsewidth sampled data P4SPWA are presented on the next three pages. Histogram time plots, histograms, and statistical analysis are presented.

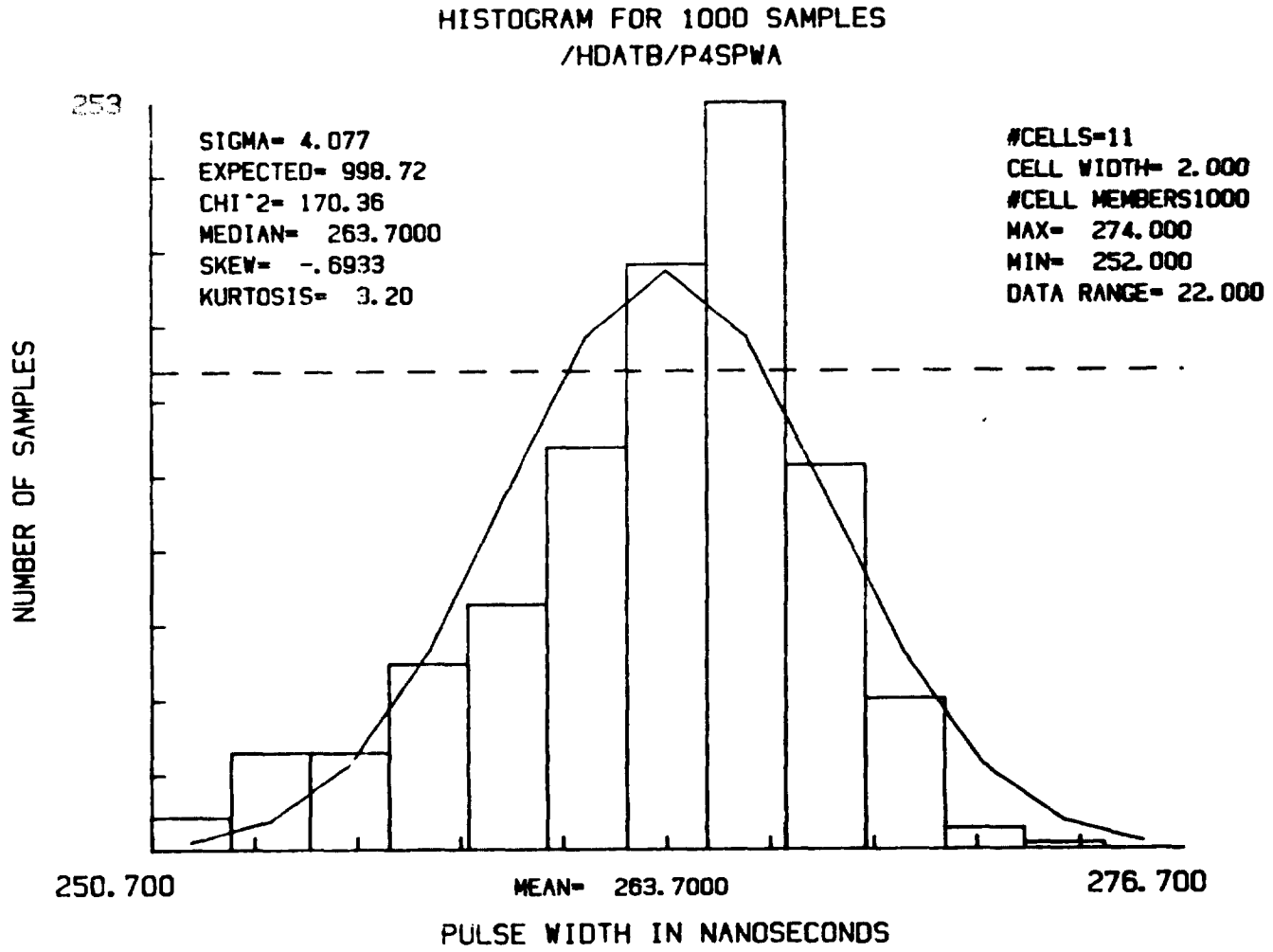
The test results section of this report contains summary statistical information associated with this pulsewidth data set.

FILENAME/NOATD/P4SPWA START TIME 1517:33:3085/09/07
MEAN= 263.7200
MAX VALUE= 274.0000 MIN VALUE= 252.0000 RANGE= 22.00
SIGMA= 4.6720
COEFFICIENT OF SKEWNESS= -.6933
COEFFICIENT OF KURTOSIS= 3.2034
OUT-OF-RANGE DATA POINTS= 0 POINTS



IF N1= 5 CW= 4.4
IF N1= 7 CW= 3.142857142857142
IF N1= 9 CW= 2.444444444444444
IF N1= 11 CW= 2
IF N1= 13 CW= 1.692307692307692
IF N1= 15 CW= 1.466666666666667
IF N1= 17 CW= 1.294117647058824
IF N1= 19 CW= 1.157894736842105
IF N1= 21 CW= 1.047619047619048
IF N1= 23 CW= .9565217391304348
IF N1= 25 CW= .88
IF N1= 27 CW= .8148148148148148
HPLOT EXECUTION TIME= 5.50MINUTES.




HISTOGRAM FOR 1000 SAMPLES
/HDATB/P4SPWA
253
SIGMA= 4.077
EXPECTED= 998.72
CHI^2= 170.36
MEDIAN= 263.7000
SKEW= -.6933
KURTOSIS= 3.20
#CELLS=11
CELL WIDTH= 2.000
#CELL MEMBERS1000
MAX= 274.000
MIN= 252.000
DATA RANGE= 22.000
NUMBER OF SAMPLES
250.700
MEAN= 263.7000
276.700
PULSE WIDTH IN NANOSECONDS

FILE /HDATB/P4SPWA

PLOT MIN= 250.7000 PLOT MAX= 276.7000
DATA MIN= 252.0000 DATA MAX= 274.0000

CELL #	CENTER	# SAMPLES	EXPECTED
1	251.7000	11	2.573
2	253.7000	33	9.665
3	255.7000	33	28.544
4	257.7000	63	66.267
5	259.7000	83	120.942
6	261.7000	136	173.517
7	263.7000	198	195.703
8	265.7000	253	173.517
9	267.7000	130	120.942
10	269.7000	51	66.267
11	271.7000	7	28.544
12	273.7000	2	9.665
13	275.7000	0	2.573

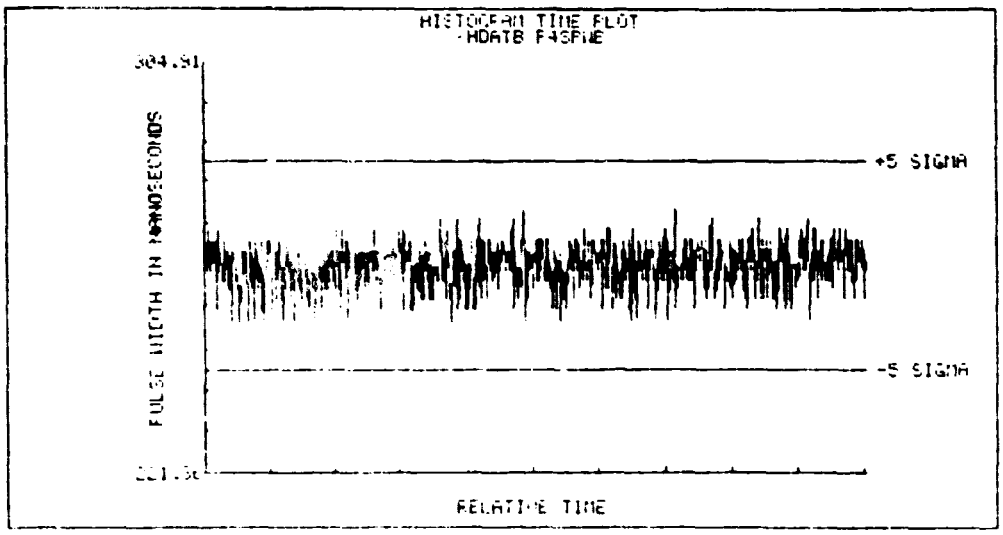
MEAN VALUE= 263.7000
STANDARD DEVIATION= 4.0770
COEFF OF SKEWNESS= -.6933
COEFF OF KURTOSIS= 3.2034
CHI-SQUARED= 170.3556
MEDIAN X VALUE= 263.7000
CELL WIDTH= 2.000000
PLOT RANGE=26.0000
SUM ACTUAL=1000
SUM EXPECTED= 998.7207
58.8PERCENT OF DATA LIES BETWEEN 261.7000 AND 265.7000

Single Pulse Pulsewidth Sampled Data - P4SPWB

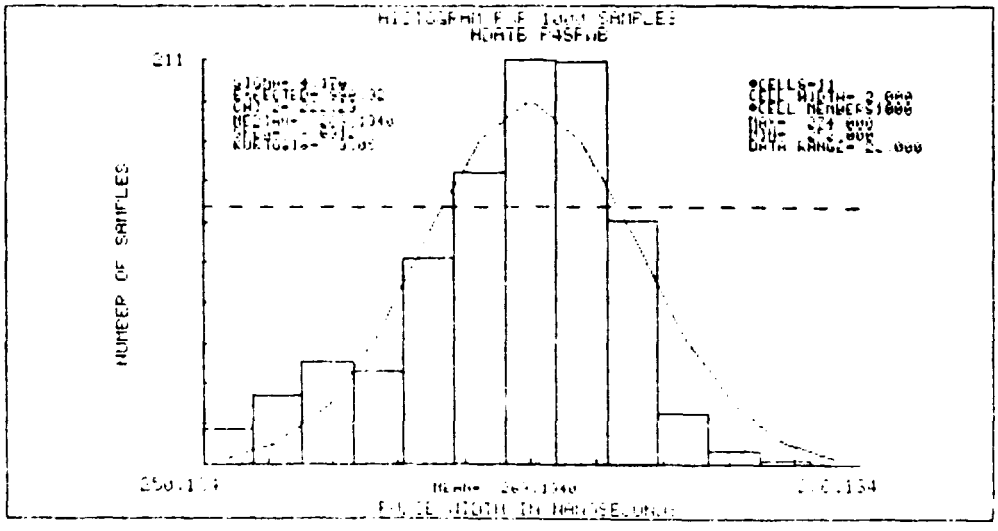
The statistical results of the single pulse pulsewidth sampled data P4SPWB are presented on the next three pages. Histogram time plots, histograms, and statistical analysis are presented.

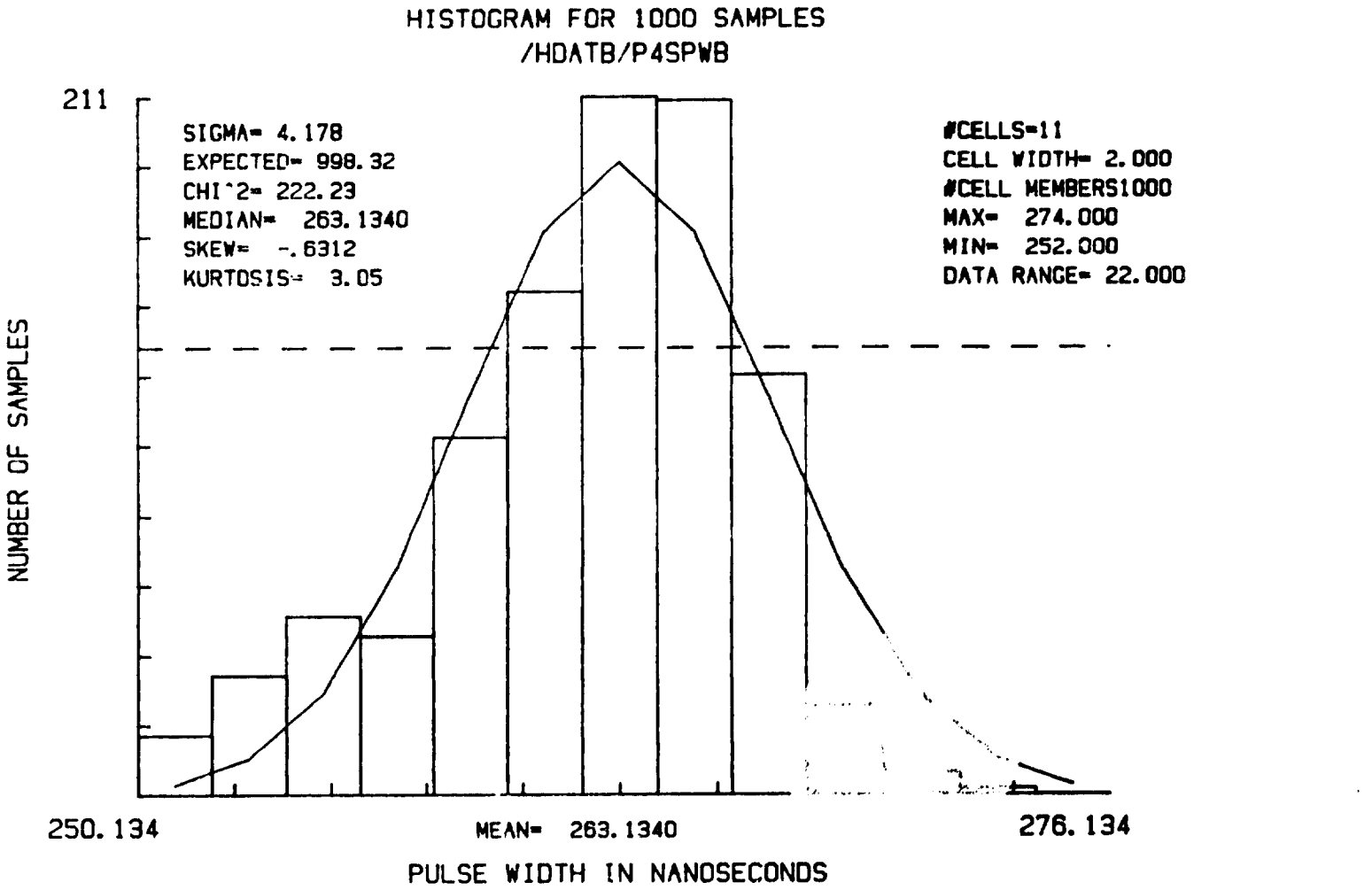
The test results section of this report contains summary statistical information associated with this pulsewidth data set.

FILENAME/HDATB/P4SP-WB START TIME 1518:26:2185/09/07
MEAN= 263.1340
MAX VALUE= 274.0000 MIN VALUE= 252.0000 RANGE= 22.00
SIGMA= 4.1778
COEFFICENT OF SKEWNESS= -.6312
COEFFICIENT OF KURTOSIS= 3.0452
OUT-OF-RANGE DATA POINTS= 0 POINTS



IF NI= 5 CW= 4 4
IF NI= 7 CW= 3.142857142857 14
IF NI= 9 CW= 2.44444444444444
IF NI= 11 CW= 2
IF NI= 13 CW= 1.692307692307 69
IF NI= 15 CW= 1.466666666666667
IF NI= 17 CW= 1.294117647058 82
IF NI= 19 CW= 1.157894736842 11
IF NI= 21 CW= 1.047619047619 05
IF NI= 23 CW= .956521739130435
IF NI= 25 CW= .88
IF NI= 27 CW= .814814814814815
HPLOT EXECUTION TIME= 5.67MINUTES.




HISTOGRAM FOR 1000 SAMPLES
/HDATB/P4SPWB
211
SIGMA= 4.178
EXPECTED= 998.32
CHI^2= 222.23
MEDIAN= 263.1340
SKEW= -.6312
KURTOSIS= 3.05
#CELLS=11
CELL WIDTH= 2.000
#CELL MEMBERS1000
MAX= 274.000
MIN= 252.000
DATA RANGE= 22.000
NUMBER OF SAMPLES
250.134
MEAN= 263.1340
276.134
PULSE WIDTH IN NANOSECONDS

FILE /HD/TB/P4SPWB

PLOT MIN= 250.1340 PLOT MAX= 276.1340
DATA MIN= 252.0000 DATA MAX= 274.0000

CELL #	CENTER	# SAMPLES	EXPECTED
1	251.1340	18	3.087
2	253.1340	36	10.886
3	255.1340	54	30.533
4	257.1340	48	68.095
5	259.1340	108	120.763
6	261.1340	152	170.305
7	263.1340	211	190.982
8	265.1340	210	170.305
9	267.1340	127	120.763
10	269.1340	27	68.095
11	271.1340	7	30.533
12	273.1340	2	10.886
13	275.1340	0	3.087

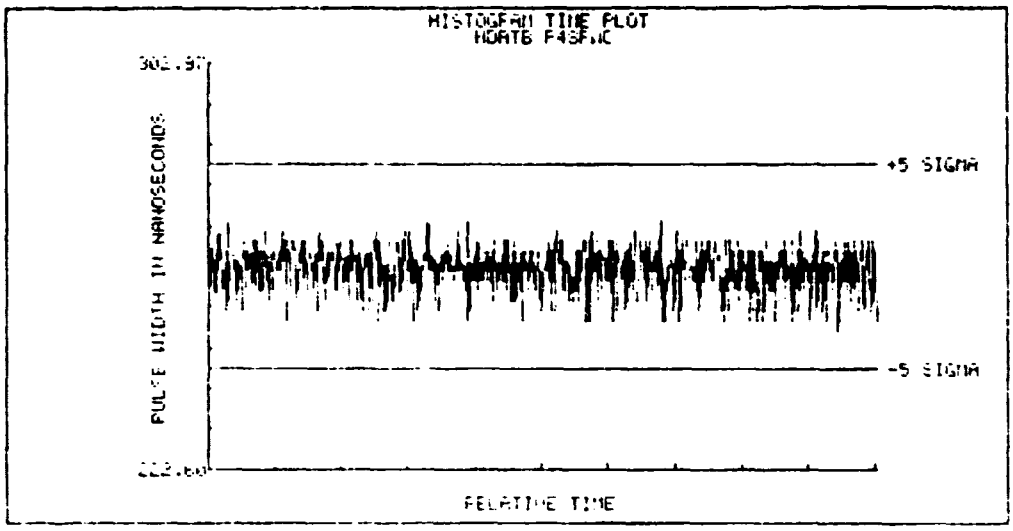
MEAN VALUE= 263.1340
STANDARD DEVIATION= 4.1778
COEFF OF SKEWNESS= -.6312
COEFF OF KURTOSIS= 3.0452
CHI-SQUARED= 222.2259
MEDIAN X VALUE= 263.1340
CELL WIDTH= 2.000000
PLOT RANGE=26.0000
SUM ACTUAL=1000
SUM EXPECTED= 998.3187
68.2PERCENT OF DATA LIES BETWEEN 259.1340 AND 265.1340

Single Pulse Pulsewidth Sampled Data - P4SPWC

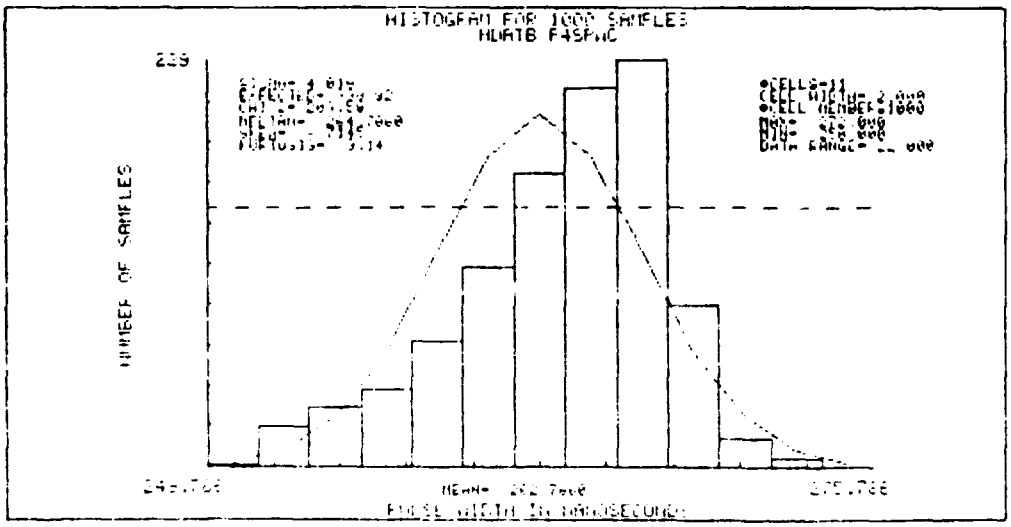
The statistical results of the single pulse pulsewidth sampled data P4SPWC are presented on the next three pages. Histogram time plots, histograms, and statistical analysis are presented.

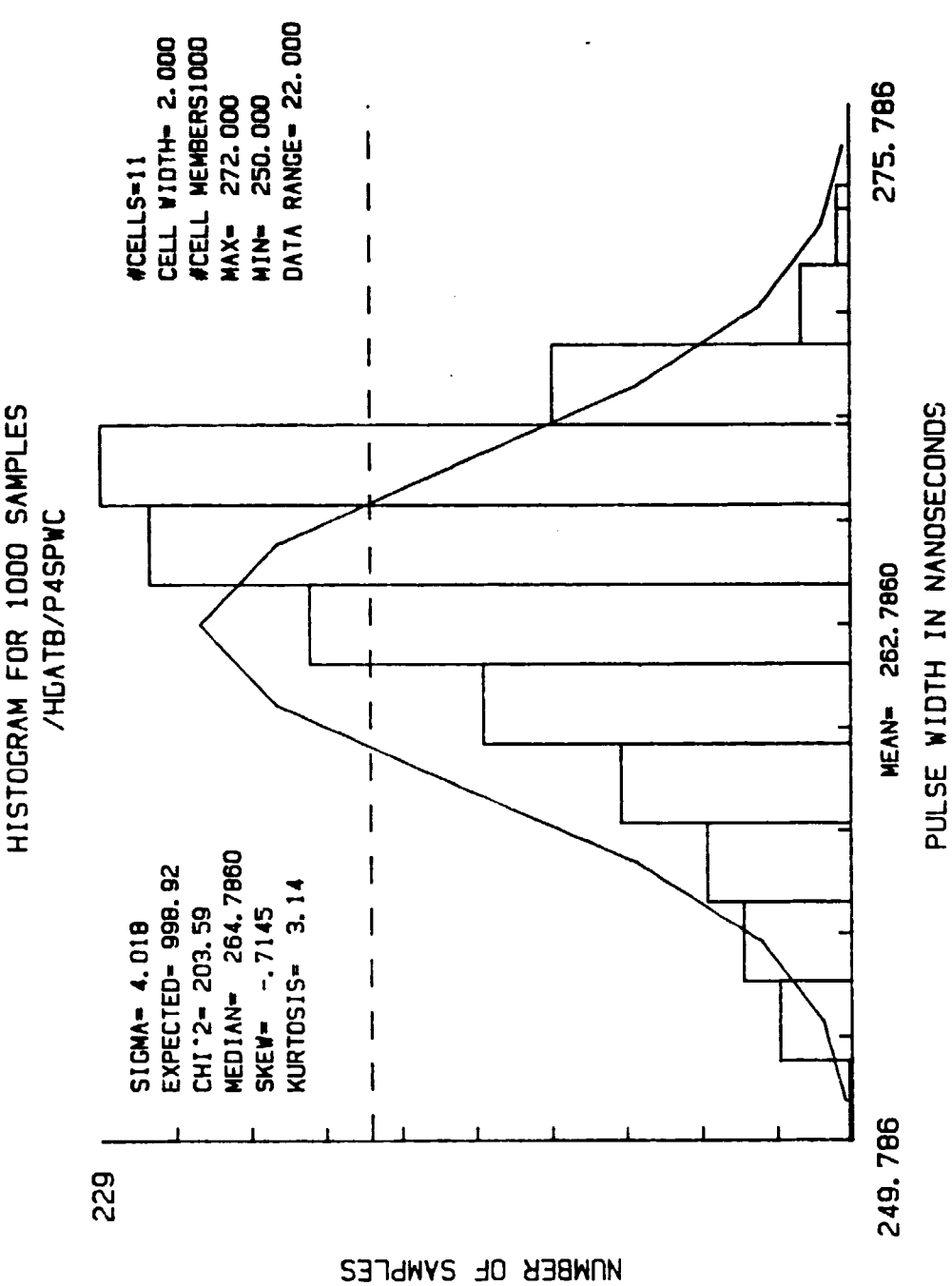
The test results section of this report contains summary statistical information associated with this pulsewidth data set.

FILENAME/HDATB/P4SPWC START TIME 1518:35:2885/09/07
MEAN= 262.7800
MAX VALUE= 272.0000 MIN VALUE= 250.0000 RANGE= 22.00
SIGMA= 4.0182
COEFFICENT OF SKEWNESS= -.7145
COEFFICIENT OF KURTOSIS= 3.1438
OUT-OF-RANGE DATA POINTS= 0 POINTS



IF N1= 5 CW= 4.4
IF N1= 7 CW= 3.14285714285714
IF N1= 9 CW= 2.44444444444444
IF N1= 11 CW= 2
IF N1= 13 CW= 1.692307692307 69
IF N1= 15 CW= 1.466666666666667
IF N1= 17 CW= 1.294117647058 82
IF N1= 19 CW= 1.157894736842 11
IF N1= 21 CW= 1.047619047619 05
IF N1= 23 CW= .956521739130435
IF N1= 25 CW= .88
IF N1= 27 CW= .814814814814815
HPLOT EXECUTION TIME= 5.18MINUTES.




HISTOGRAM FOR 1000 SAMPLES
/HGATB/P4SPWC
#CELLS=11
CELL WIDTH= 2.000
#CELL MEMBERS1000
MAX= 272.000
MIN= 250.000
DATA RANGE= 22.000
SIGMA= 4.018
EXPECTED= 998.92
CHI'2= 203.59
MEDIAN= 264.7860
SKEW= -.7145
KURTOSIS= 3.14
229
NUMBER OF SAMPLES
249.786
MEAN= 262.7860
275.786
PULSE WIDTH IN NANOSECONDS

FILE /HOME/P4SPWC

PLOT MIN= 249.7860 PLOT MAX= 275.7860
DATA MIN= 250.0000 DATA MAX= 272.0000

CELL #	CENTER	# SAMPLES	EXPECTED
1	250.7860	1	2.298
2	252.7860	22	8.975
3	254.7860	33	27.364
4	256.7860	44	65.125
5	258.7860	70	120.983
6	260.7860	112	175.432
7	262.7860	165	198.566
8	264.7860	214	175.432
9	266.7860	229	120.983
10	268.7860	91	65.125
11	270.7860	15	27.364
12	272.7860	4	8.975
13	274.7860	0	2.298

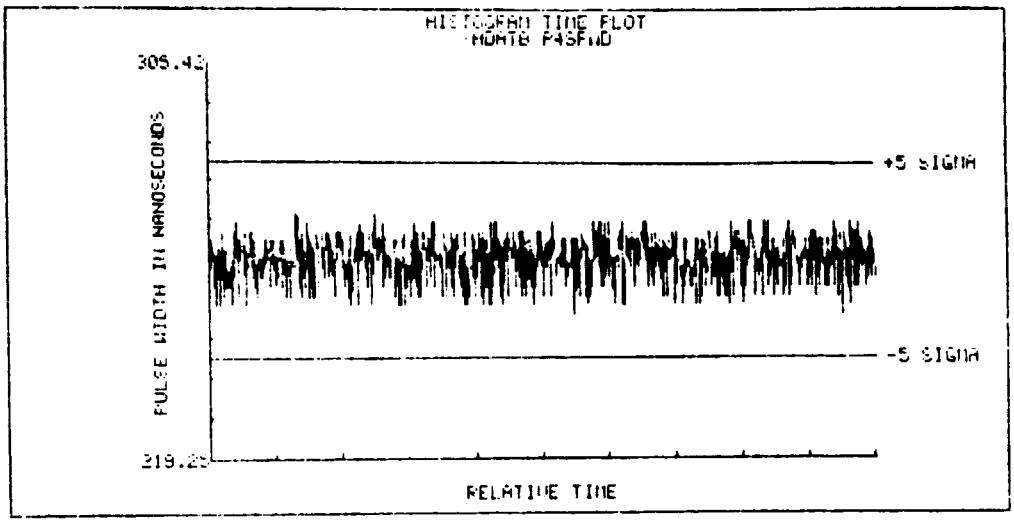
MEAN VALUE= 262.7860
STANDARD DEVIATION= 4.0182
COEFF OF SKEWNESS= -.7145
COEFF OF KURTOSIS= 3.1438
CHI-SQUARED- 203.5859
MEDIAN X VALUE= 264.7860
CELL WIDTH= 2.000000
PLOT RANGE=26.0000
SUM ACTUAL=1000
SUM EXPECTED= 998.9193
72.3PERCENT OF DATA LIES BETWEEN 260.7860 AND 266.7860

Single Pulse Pulsewidth Sampled Data - P4SPWD

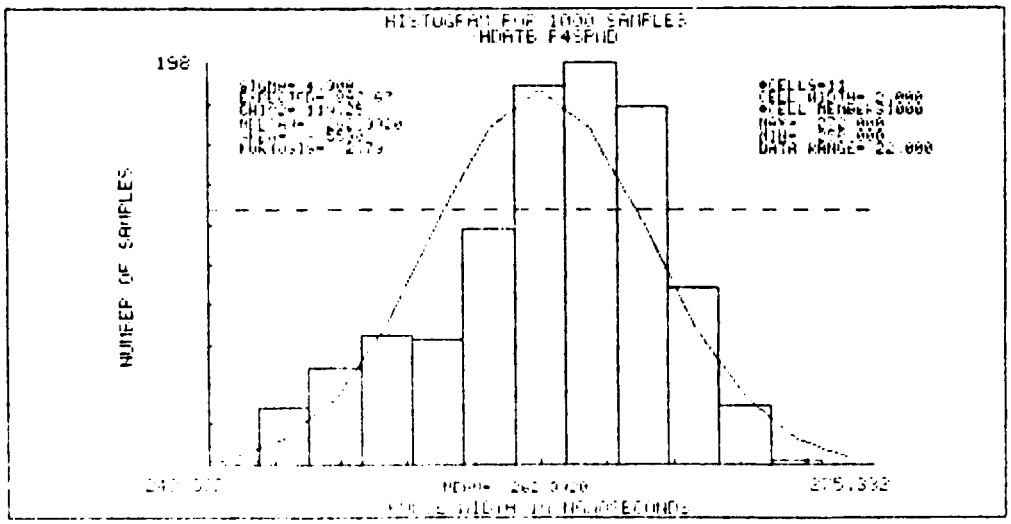
The statistical results of the single pulse pulsewidth sampled data P4SPWD are presented on the next three pages. Histogram time plots, histograms, and statistical analysis are presented.

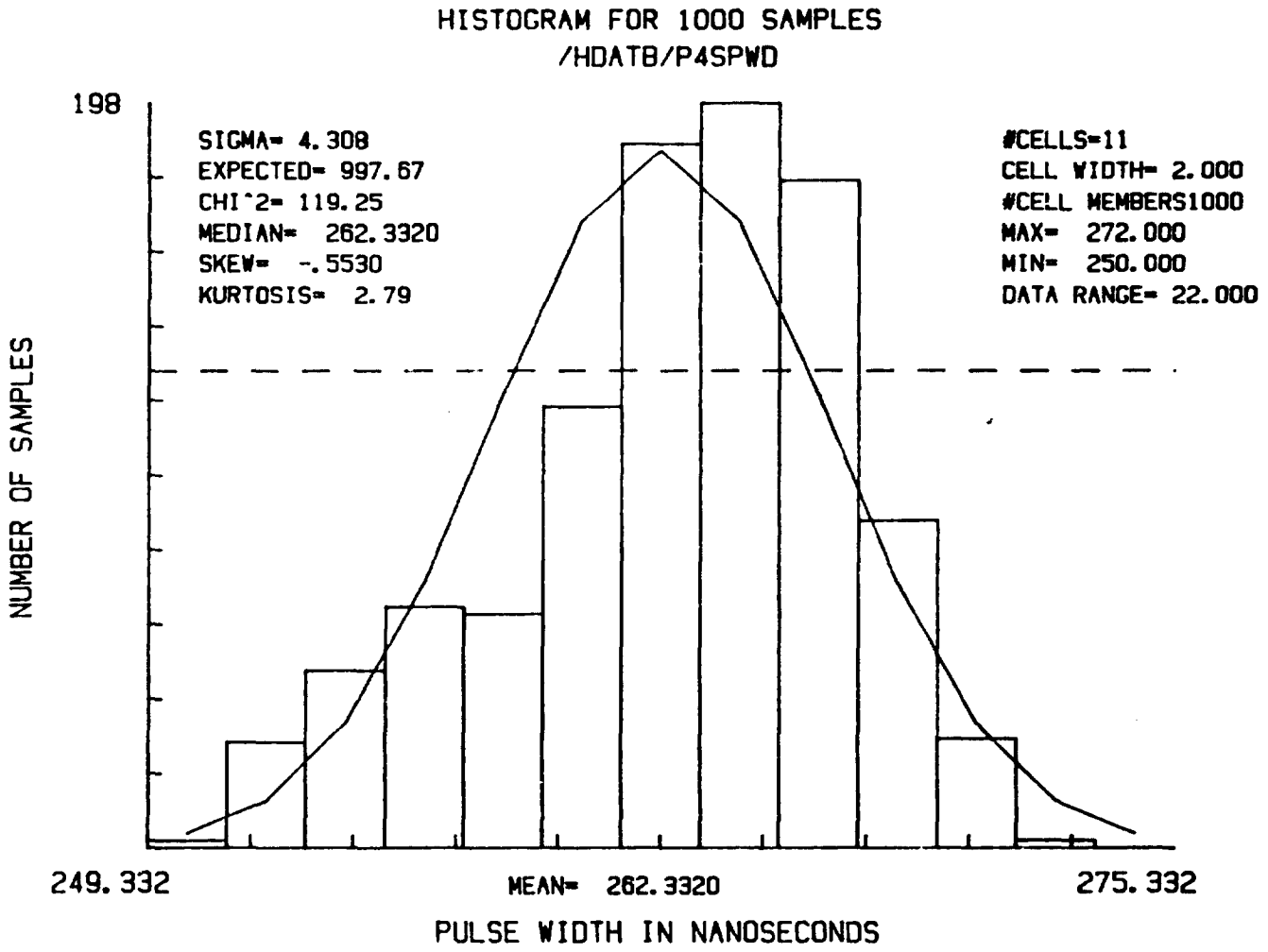
The test results section of this report contains summary statistical information associated with this pulsewidth data set.

```
FILENAME/HDATA3/P4SPWD                    START TIME 1513:14:3885/09/08
MEAN= 262.3370
MAX VALUE= 272.0000   MIN VALUE= 250.0000   RANG      22.00
SIGMA= 4.3083
COEFFICIENT OF SKEWNESS=  -.5530
COEFFICIENT OF KURTOSIS= 2.7896
OUT-OF-RANGE DATA POINTS=  0 POINTS
```




```
IF N1= 5   CW= 4.4
IF N1= 7   CW= 3.14285714285714
IF N1= 9   CW= 2.44444444444444
IF N1= 11   CW= 2
IF N1= 13   CW= 1.69230769230769
IF N1= 15   CW= 1.46666666666667
IF N1= 17   CW= 1.29411764705882
IF N1= 19   CW= 1.15789473684211
IF N1= 21   CW= 1.04761904761905
IF N1= 23   CW= .956521739130435
IF N1= 25   CW= .88
IF N1= 27   CW= .814814814814815
HPLOT EXECUTION TIME=  5.73MINUTES.
```




HISTOGRAM FOR 1000 SAMPLES
/HDATB/P4SPWD
198
SIGMA= 4.308
EXPECTED= 997.67
CHI^2= 119.25
MEDIAN= 262.3320
SKEW= -.5530
KURTOSIS= 2.79
#CELLS=11
CELL WIDTH= 2.000
#CELL MEMBERS1000
MAX= 272.000
MIN= 250.000
DATA RANGE= 22.000
NUMBER OF SAMPLES
249.332
MEAN= 262.3320
275.332
PULSE WIDTH IN NANOSECONDS

FILE /HDATD/P4SPWD

PLOT MIN= 249.3320 PLOT MAX= 275.3320
DATA MIN= 250.0000 DATA MAX= 272.0000

CELL #	CENTER	# SAMPLES	EXPECTED
1	250.3320	2	3.828
2	252.3320	28	12.525
3	254.3320	47	33.031
4	256.3320	64	70.223
5	258.3320	62	120.352
6	260.3320	117	166.278
7	262.3320	187	185.195
8	264.3320	198	166.278
9	266.3320	177	120.352
10	268.3320	87	70.223
11	270.3320	29	33.031
12	272.3320	2	12.525
13	274.3320	0	3.828

MEAN VALUE= 262.3320
STANDARD DEVIATION= 4.3083
COEFF OF SKEWNESS= -.5530
COEFF OF KURTOSIS= 2.7896
CHI-SQUARED= 119.2548
MEDIAN X VALUE= 262.3320
CELL WIDTH= 2.000000
PLOT RANGE=26.0000
SUM ACTUAL=1000
SUM EXPECTED= 997.6697
68.0PERCENT OF DATA LIES BETWEEN 260.3320 AND 266.3320

APPENDIX D

INTRODUCTION

ELINT parameter test results are contained in this appendix for the PRI parameter associated with the HOOD radar. These measurements were performed with the Microwave Counter. The single pulse PRI data sets are labelled:

P4SRRA

P4SRRB

P4SRRC

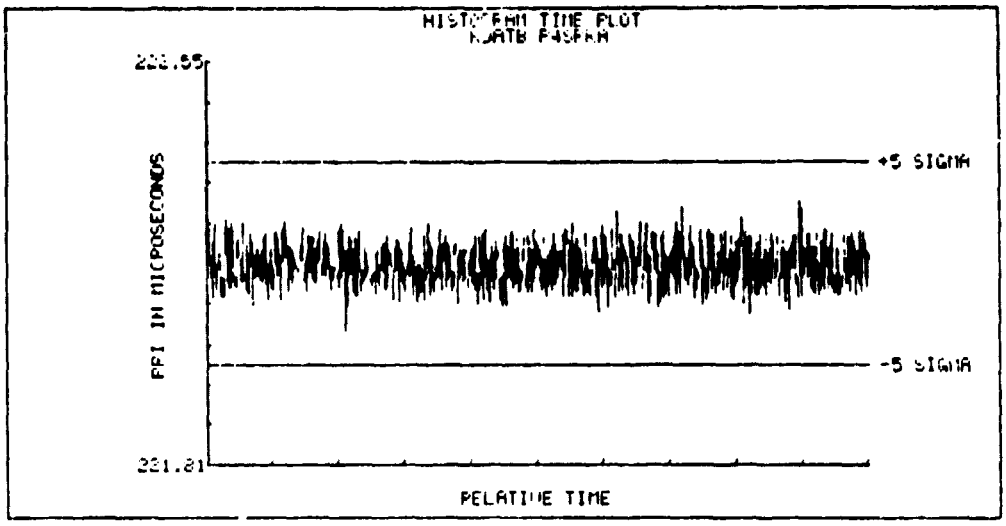
P4SRRD

Single Pulse PRI Sampled Data - P4SRRA

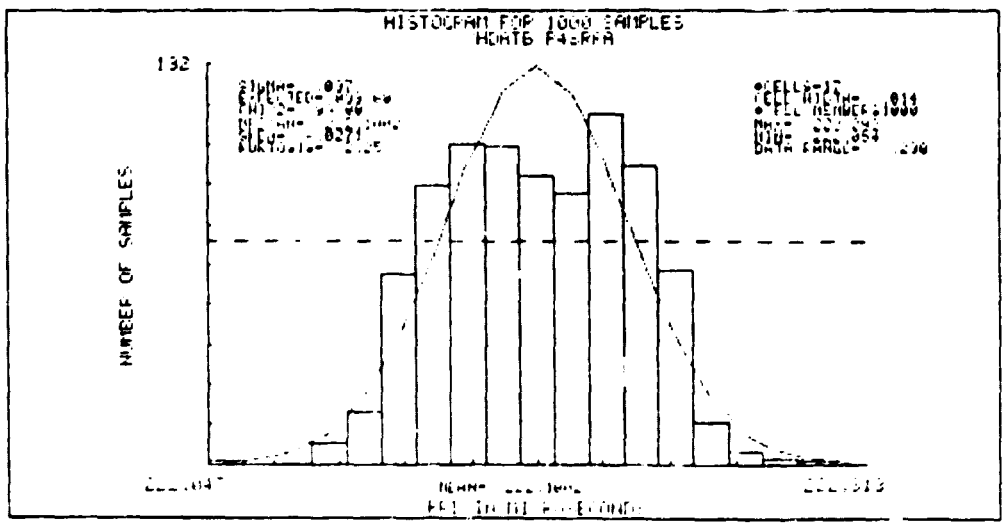
The statistical results of the single pulse PRI sampled data P4SRRA are presented on the next three pages. Histogram time plots, histograms, and statistical analysis are presented.

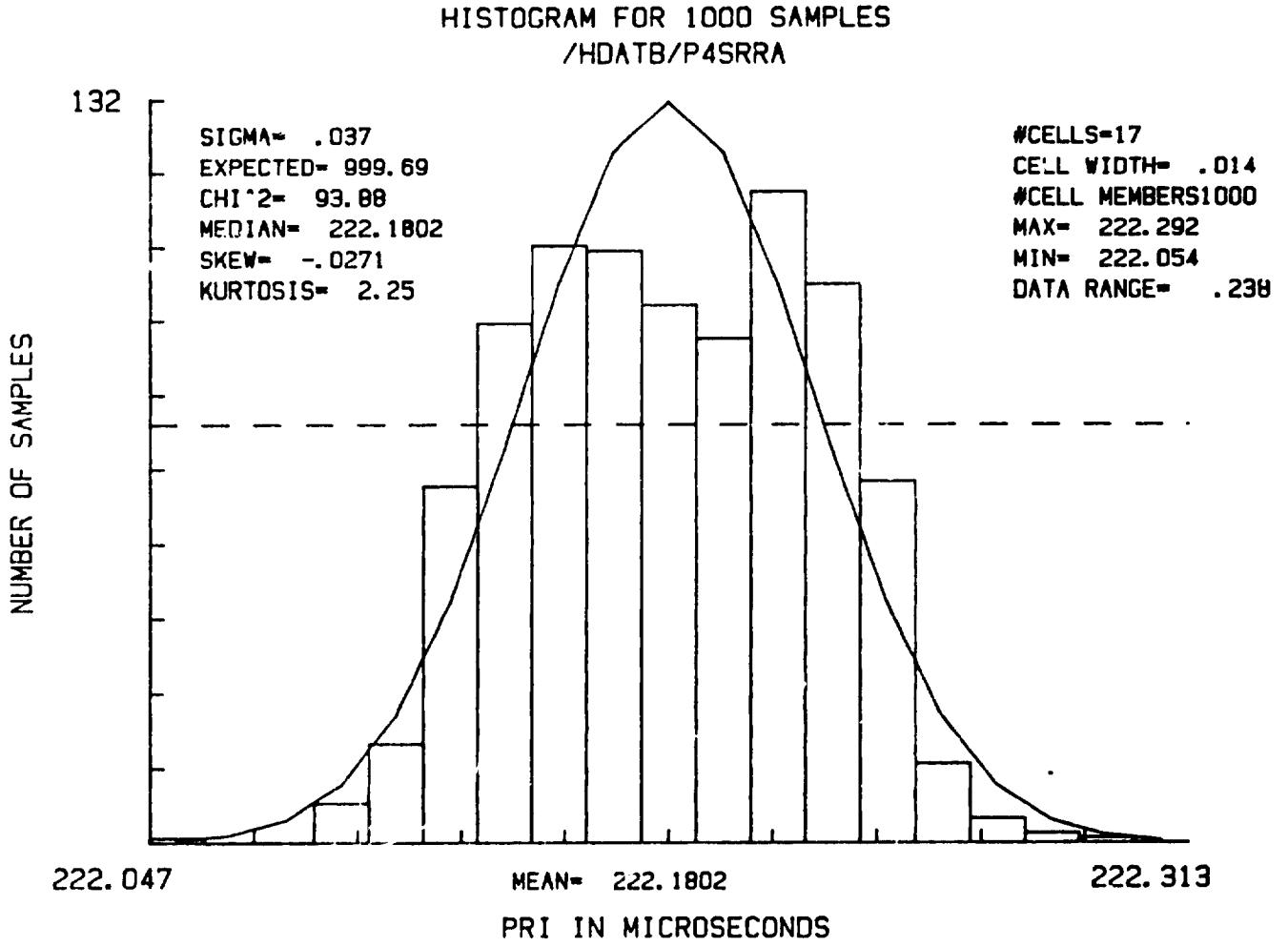
The test results section of this report contains summary statistical information associated with this PRI data set.

```
FILENAME/HDATB/P4SRRA                          START TIME IS16:35:4485/09/07
MEAN=  222.1802
MAX VALUE=  222.2920   MIN VALUE=  222.0540   RANGE=      .24
SIGMA=  .0371
COEFFICENT OF SKEWNESS=  -.0271
COEFFICIENT OF KURTOSIS= 2.2472
OUT-OF-RANGE DATA POINTS=  0 POINTS
```




```
IF N1= 5  CW= .0475999999999999
IF N1= 7  CW= .0339999999999999
IF N1= 9  CW= .0264444444444444
IF N1= 11  CW= .0216363636363636
IF N1= 13  CW= .0183076923076923
IF N1= 15  CW= .0158666666666666
IF N1= 17  CW= .014
IF N1= 19  CW= .0125263157894737
IF N1= 21  CW= .0113333333333333
IF N1= 23  CW= .0103478260869565
IF N1= 25  CW= .00951999999999998
IF N1= 27  CW= .0088148148148148
HPLOT EXECUTION TIME=  7.40MINUTES.
```




HISTOGRAM FOR 1000 SAMPLES
/HDATB/P4SRRA
132
SIGMA= .037
EXPECTED= 999.69
CHI^2= 93.88
MEDIAN= 222.1802
SKEW= -.0271
KURTOSIS= 2.25
#CELLS=17
CELL WIDTH= .014
#CELL MEMBERS1000
MAX= 222.292
MIN= 222.054
DATA RANGE= .238
NUMBER OF SAMPLES
222.047
MEAN= 222.1802
222.313
PRI IN MICROSECONDS

FILE /HDATB/P4SRRA

PLOT MIN= 222.0472 PLOT MAX= 222.3137
DATA MIN= 222.0540 DATA MAX= 222.2920

CELL #	CENTER	# SAMPLES	EXPECTED
1	222.0542	1	.475
2	222.0682	0	1.591
3	222.0822	0	4.620
4	222.0962	8	11.640
5	222.1102	20	25.441
6	222.1242	72	48.237
7	222.1382	105	79.336
8	222.1522	121	113.194
9	222.1662	120	140.099
10	222.1802	109	150.420
11	222.1942	102	140.099
12	222.2082	132	113.194
13	222.2222	113	79.336
14	222.2362	73	48.237
15	222.2502	16	25.441
16	222.2642	5	11.640
17	222.2782	2	4.620
18	222.2922	1	1.591
19	222.3062	0	.475

MEAN VALUE= 222.1802
STANDARD DEVIATION= .0371
COEFF OF SKEWNESS= -.0271
COEFF OF KURTOSIS= 2.2472
CHI-SQUARED= 93.8837
MEDIAN X VALUE= 222.1802
CELL WIDTH= .014000
PLOT RANGE= .2660
SUM ACTUAL=1000
SUM EXPECTED= 999.8858

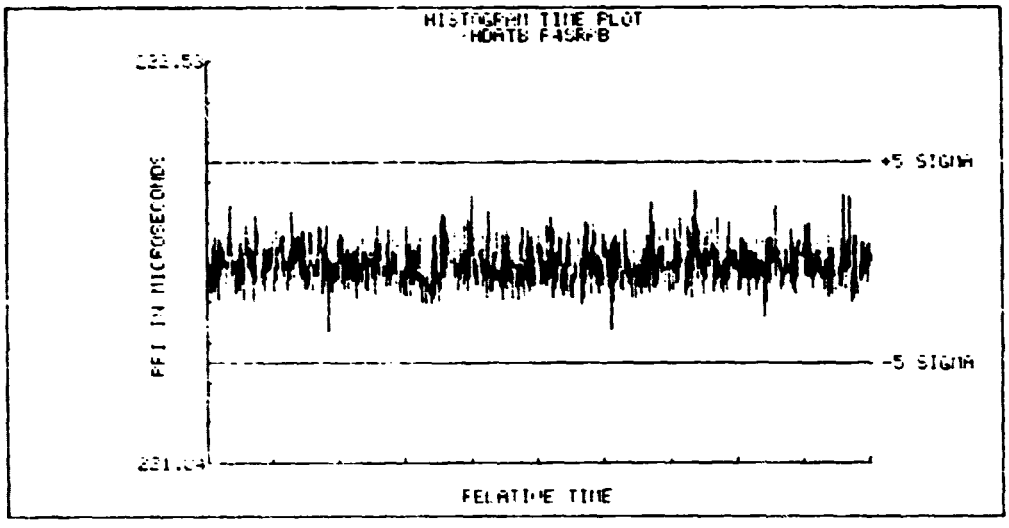
50.5PERCENT OF DATA LIES BETWEEN 222.1522 AND 222.2082

Single Pulse PRI Sampled Data - P4SRRB

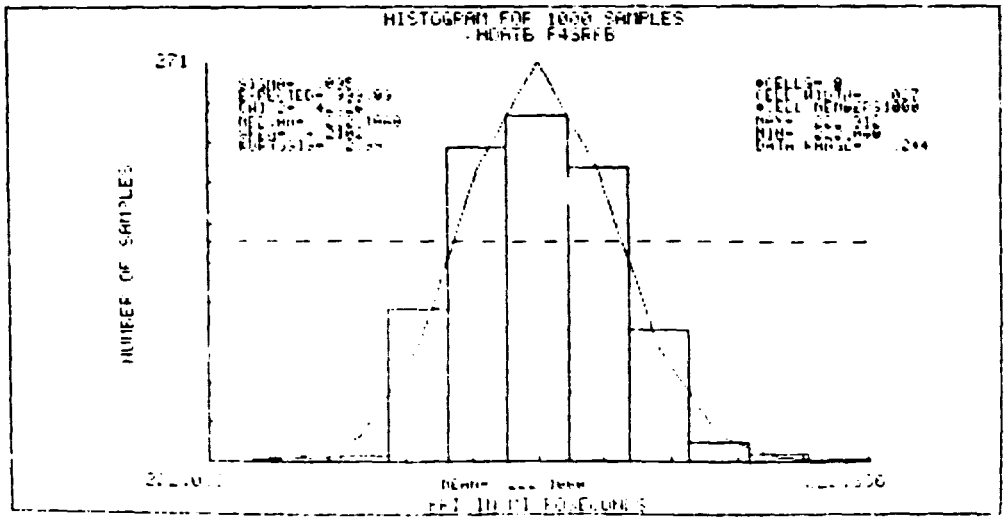
The statistical results of the single pulse PRI sampled data P4SRRB are presented on the next three pages. Histogram time plots, histograms, and statistical analysis are presented.

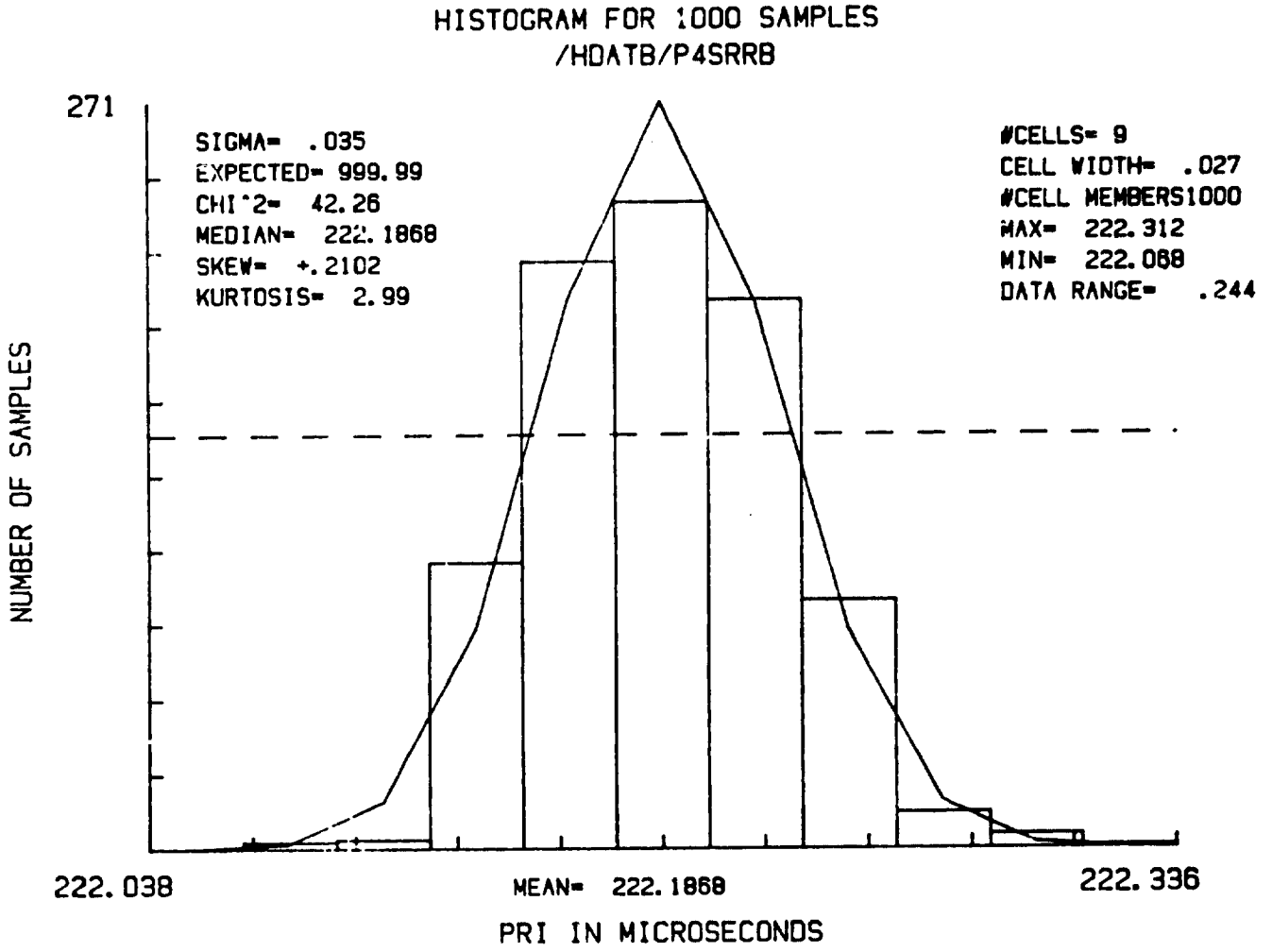
The test results section of this report contains summary statistical information associated with this PRI data set.

FILENAME/HDATB/P4SRRB START TIME IS16:47:2185/09/07
MEAN= 222.1868
MAX VALUE= 222.3120 MIN VALUE= 222.0680 RANGE= .24
SIGMA= .0346
COEFFICENT OF SKEWNESS= +.2102
COEFFICIENT OF KURTOSIS= 2.9882
OUT-OF-RANGE DATA POINTS= 0 POINTS



IF N1= 5 CW= .0488
IF N1= 7 CW= .0348571428571428
IF N1= 9 CW= .0271111111111111
IF N1= 11 CW= .0221818181818182
IF N1= 13 CW= .0187692307692308
IF N1= 15 CW= .0162666666666667
IF N1= 17 CW= .0143529411764706
IF N1= 19 CW= .0128421052631579
IF N1= 21 CW= .0116190476190476
IF N1= 23 CW= .0105086956521739
IF N1= 25 CW= .0097599999999999
IF N1= 27 CW= .0090370370370370
HPLOT EXECUTION TIME= 5.75MINUTES.




HISTOGRAM FOR 1000 SAMPLES
/HDATB/P4SRRB
271
SIGMA= .035
EXPECTED= 999.99
CHI^2= 42.26
MEDIAN= 222.1868
SKEW= +.2102
KURTOSIS= 2.99
#CELLS= 9
CELL WIDTH= .027
#CELL MEMBERS1000
MAX= 222.312
MIN= 222.068
DATA RANGE= .244
NUMBER OF SAMPLES
222.038
MEAN= 222.1868
222.336
PRI IN MICROSECONDS

FILE /HDATB/P4SRR8

PLOT MIN= 222.0377 PLOT MAX= 222.3359
DATA MIN= 222.0680 DATA MAX= 222.3120

CELL #	CENTER	# SAMPLES	EXPECTED
1	222.0512	0	.145
2	222.0783	3	2.296
3	222.1054	4	19.707
4	222.1326	120	91.526
5	222.1597	246	229.986
6	222.1868	271	312.671
7	222.2139	230	229.986
8	222.2410	104	91.526
9	222.2681	15	19.707
10	222.2952	6	2.296
11	222.3223	1	.145

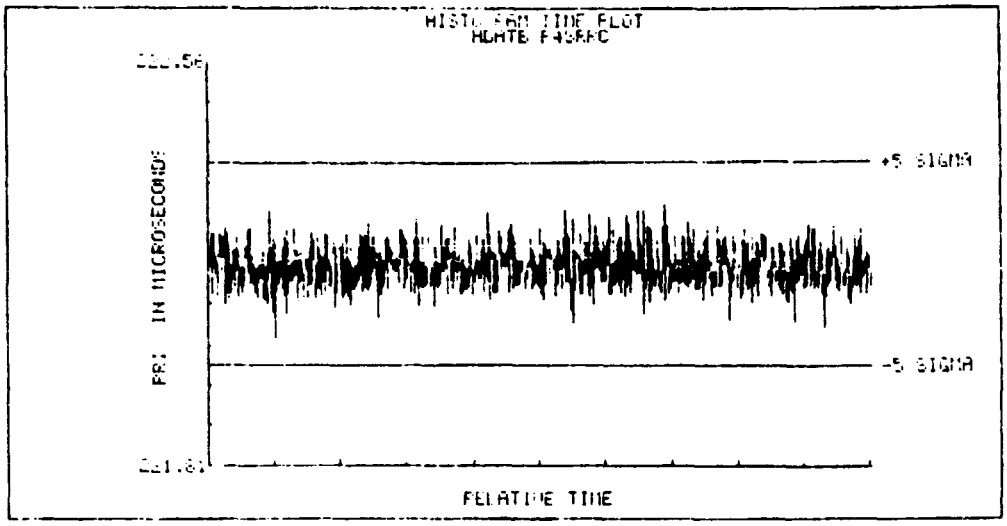
MEAN VALUE= 222.1868
STANDARD DEVIATION= .0346
COEFF OF SKEWNESS= +.2102
COEFF OF KURTOSIS= 2.9882
CHI-SQUARED= 42.2638
MEDIAN X VALUE= 222.1868
CELL WIDTH= .027111
PLOT RANGE= .2982
SUM ACTUAL=1000
SUM EXPECTED= 999.9899
75.2PERCENT OF DATA LIES B. 'EEN 222.1597 AND 222.2139

Single Pulse PRI Sampled Data - P4SRRC

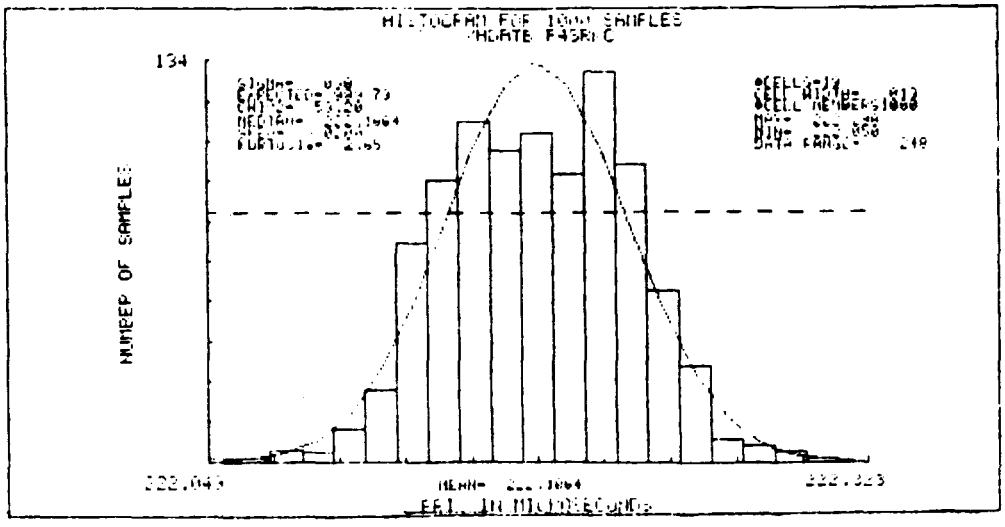
The statistical results of the single pulse PRI sampled data P4SRRC are presented on the next three pages. Histogram time plots, histograms, and statistical analysis are presented.

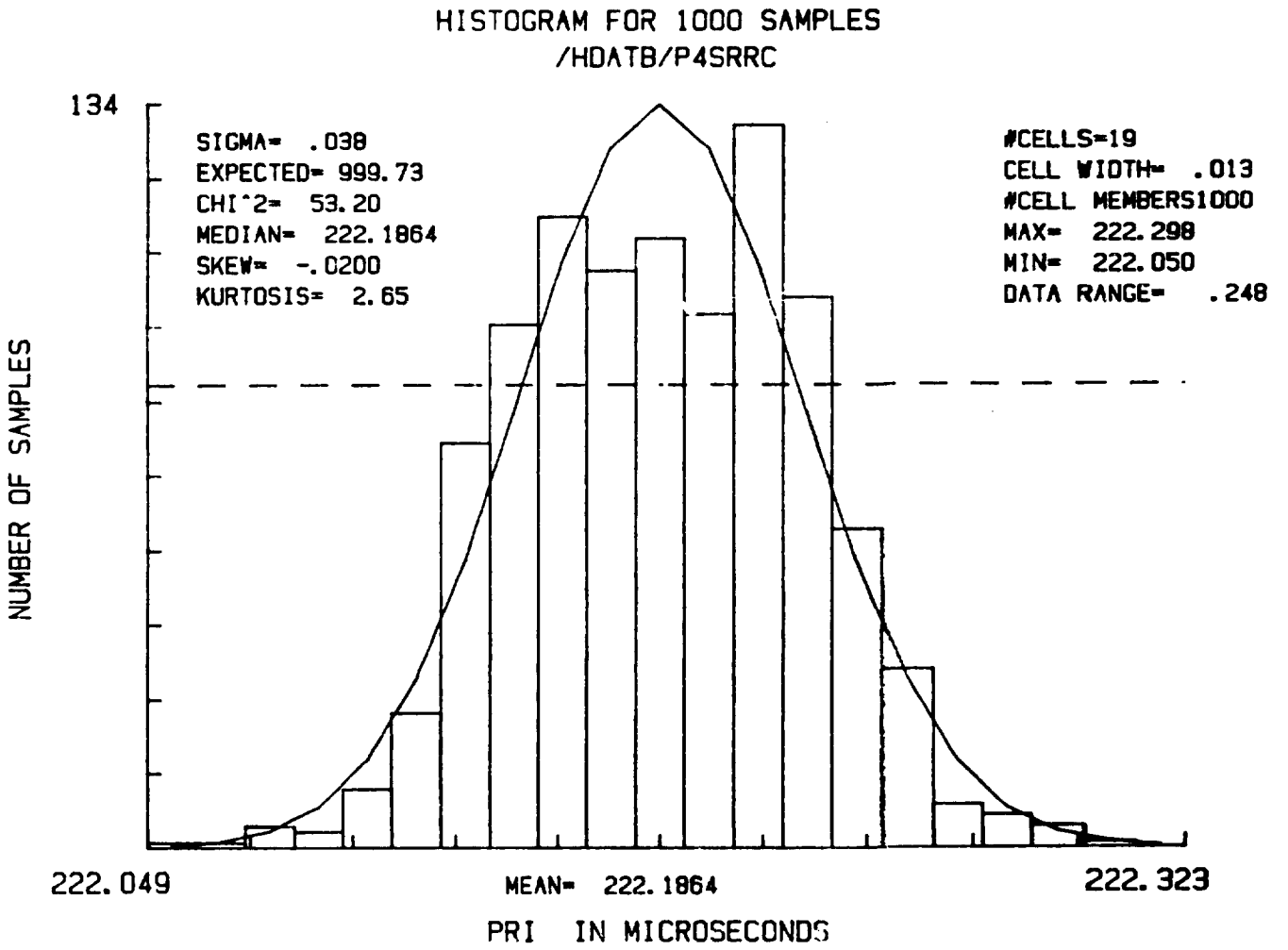
The test results section of this report contains summary statistical information associated with this PRI data set.

```
FILENAME/HDATB/P4SRRC                          START TIME IS17:05:5085/09/07
MEAN=  222.1864
MAX VALUE=  222.2980   MIN VALUE=  222.0500   RANGE=      .25
SIGMA=  .0378
COEFFICENT OF SKEWNESS=  -.0200
COEFFICIENT OF KURTOSIS= 2.6550
OUT-OF-RANGE DATA POINTS=  0 POINTS
```




```
IF N1= 5   CW= .0496000000000038
IF N1= 7   CW= .0354285714285741
IF N1= 9   CW= .0275555555555577
IF N1= 11   CW= .0225454545454563
IF N1= 13   CW= .0190769230769245
IF N1= 15   CW= .0165333333333346
IF N1= 17   CW= .0145082352941188
IF N1= 19   CW= .0130526315789484
IF N1= 21   CW= .0118095238095247
IF N1= 23   CW= .0107826086956653
IF N1= 25   CW= .0099200000000075
IF N1= 27   CW= .0091851851851588
HPLOT EXECUTION TIME=  7.40MINUTES.
```




HISTOGRAM FOR 1000 SAMPLES
/HDATB/P4SRRC
134
SIGMA= .038
EXPECTED= 999.73
CHI^2= 53.20
MEDIAN= 222.1864
SKEW= -.0200
KURTOSIS= 2.65
#CELLS=19
CELL WIDTH= .013
#CELL MEMBERS1000
MAX= 222.298
MIN= 222.050
DATA RANGE= .248
NUMBER OF SAMPLES
222.049
MEAN= 222.1864
222.323
PRI IN MICROSECONDS

FILE /HDATB/P4SRRC

PLOT MIN= 222.0493 PLOT MAX= 222.3234
DATA MIN= 222.0500 DATA MAX= 222.2980

CELL #	CENTER	# SAMPLES	EXPECTED
1	222.0559	1	.357
2	222.0689	1	1.107
3	222.0820	4	3.046
4	222.0950	3	7.441
5	222.1081	11	16.137
6	222.1211	25	31.068
7	222.1342	75	53.097
8	222.1472	97	80.557
9	222.1603	117	108.497
10	222.1733	107	129.719
11	222.1864	113	137.679
12	222.1994	99	129.719
13	222.2125	134	108.497
14	222.2255	107	80.557
15	222.2386	59	53.097
16	222.2516	33	31.068
17	222.2647	8	16.137
18	222.2777	6	7.441
19	222.2908	4	3.046
20	222.3039	1	1.107
21	222.3169	0	.357

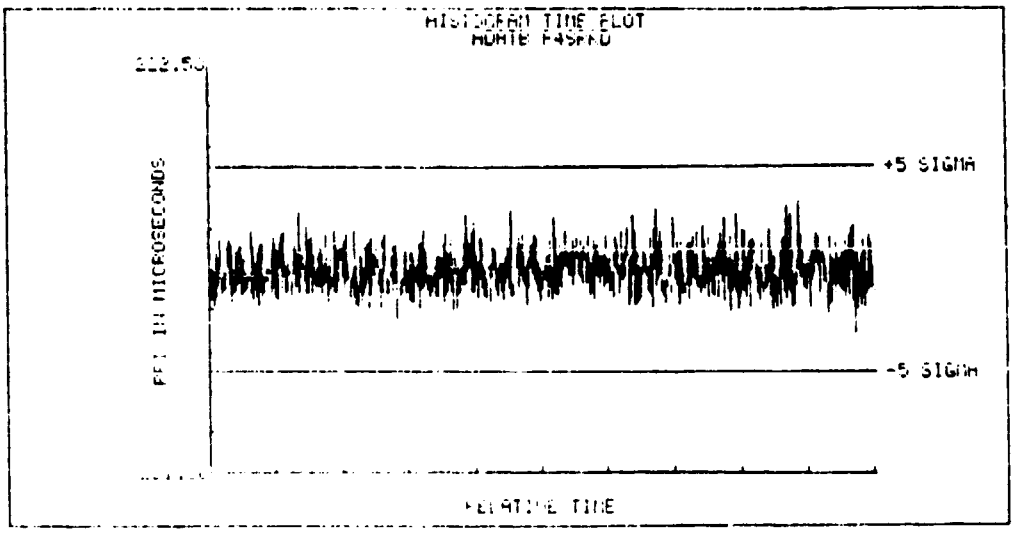
MEAN VALUE= 222.1864
STANDARD DEVIATION= .0378
COEFF OF SKEWNESS= -.0200
COEFF OF KURTOSIS= 2.6550
CHI-SQUARED= 53.2003
MEDIAN X VALUE= 222.1864
CELL WIDTH= .013053
PLOT RANGE= .2741
SUM ACTUAL=1000
SUM EXPECTED= 999.7290
57.1PERCENT OF DATA LIES BETWEEN 222.1603 AND 222.2125

Single Pulse PRI Sampled Data - P4SRRD

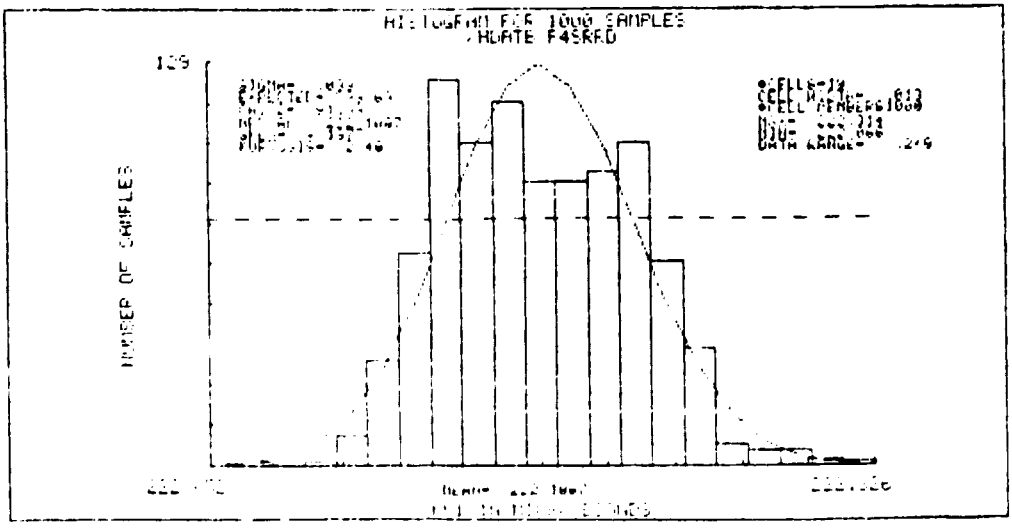
The statistical results of the single pulse PRI sampled data P4SRRD are presented on the next three pages. Histogram time plots, histograms, and statistical analysis are presented.

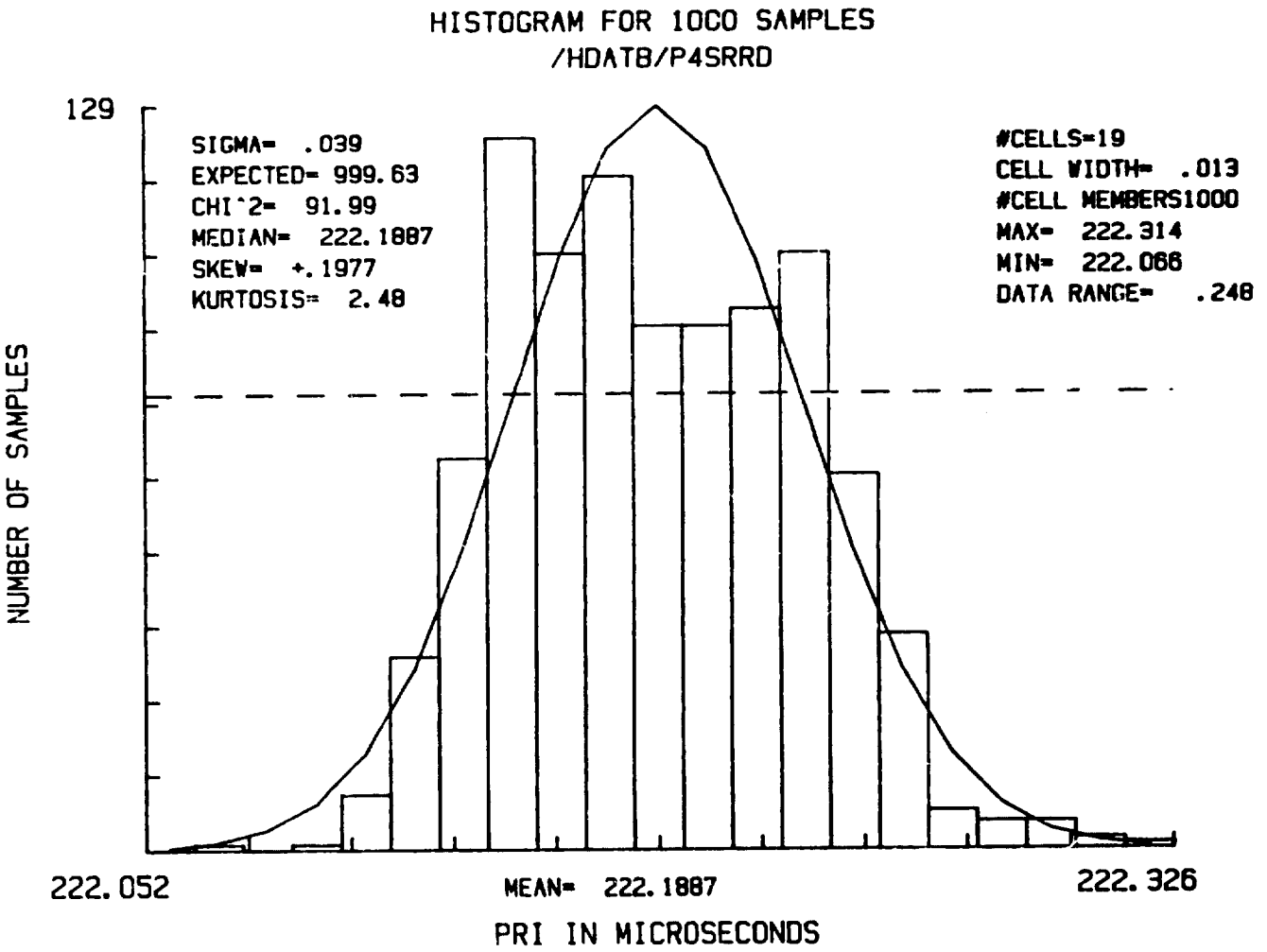
The test results section of this report contains summary statistical information associated with this PRI data set.

FILENAME/UDATD/P4SRUD [illegible] START TIME IS17:20:3285/05/07
[illegible] 222.0000 RANGE= .25
OUT-OF-RANGE DATA POINTS= 0 POINTS



IF N1= 5 CW= .0495999999999981
IF N1= 7 CW= .0354285714285701
IF N1= 9 CW= .0275555555555545
IF N1= 11 CW= .0225454545454537
IF N1= 13 CW= .0190769230769223
IF N1= 15 CW= .0165333333333327
IF N1= 17 CW= .0145882352941171
IF N1= 19 CW= .0130526315789469
IF N1= 21 CW= .0118095238095234
IF N1= 23 CW= .0107826086956518
IF N1= 25 CW= .0099199999999962
IF N1= 27 CW= .0091851851851483
HPLOT EXECUTION TIME= 8.43MINUTES.




HISTOGRAM FOR 1000 SAMPLES
/HDATB/P4SRRD
129
SIGMA= .039
EXPECTED= 999.63
CHI^2= 91.99
MEDIAN= 222.1887
SKEW= +.1977
KURTOSIS= 2.48
#CELLS=19
CELL WIDTH= .013
#CELL MEMBERS1000
MAX= 222.314
MIN= 222.066
DATA RANGE= .248
NUMBER OF SAMPLES
222.052
MEAN= 222.1887
222.326
PRI IN MICROSECONDS

FILE /HDATB/P4SRRD

PLOT MIN= 222.0516 PLOT MAX= 222.3257
DATA MIN= 222.0660 DATA MAX= 222.3140

CELL #	CENTER	# SAMPLES	EXPECTED
1	222.0581	0	.455
2	222.0712	1	1.342
3	222.0842	0	3.530
4	222.0973	1	8.286
5	222.1103	10	17.358
6	222.1234	35	32.455
7	222.1364	71	54.155
8	222.1495	129	80.645
9	222.1626	108	107.180
10	222.1756	122	127.125
11	222.1887	95	134.567
12	222.2017	95	127.125
13	222.2148	98	107.180
14	222.2278	108	80.645
15	222.2409	68	54.155
16	222.2539	39	32.455
17	222.2670	7	17.358
18	222.2800	5	8.286
19	222.2931	5	3.530
20	222.3061	2	1.342
21	222.3192	1	.455

MEAN VALUE= 222.1887
STANDARD DEVIATION= .0387
COEFF OF SKEWNESS= +.1977
COEFF OF KURTOSIS= 2.4798
CHI-SQUARED= 91.9906
MEDIAN X VALUE= 222.1887
CELL WIDTH= .013053
PLOT RANGE= .2741
SUM ACTUAL=1000
SUM EXPECTED= 999.6270
52.0PERCENT OF DATA LIES BETWEEN 222.1626 AND 222.2148

APPENDIX E

INTRODUCTION

ELINT parameter test results are contained in this appendix for the averaged frequency parameter associated with the HOOD radar. These measurements were performed with the Microwave Counter. The single pulse frequency data sets are labelled:

P4RFA

P4ORFB

P4ORFC

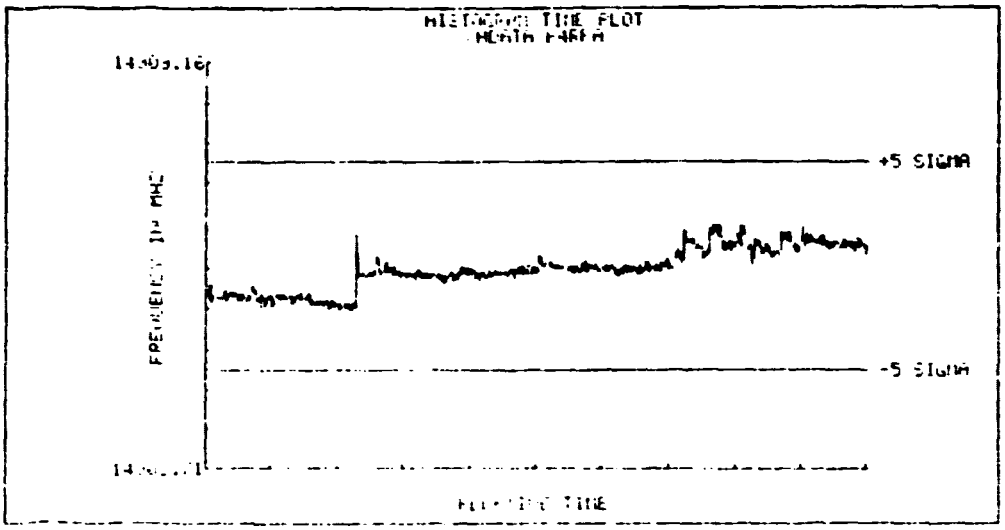
P4ORFD

Average Frequency Sampled Data - P4RFA

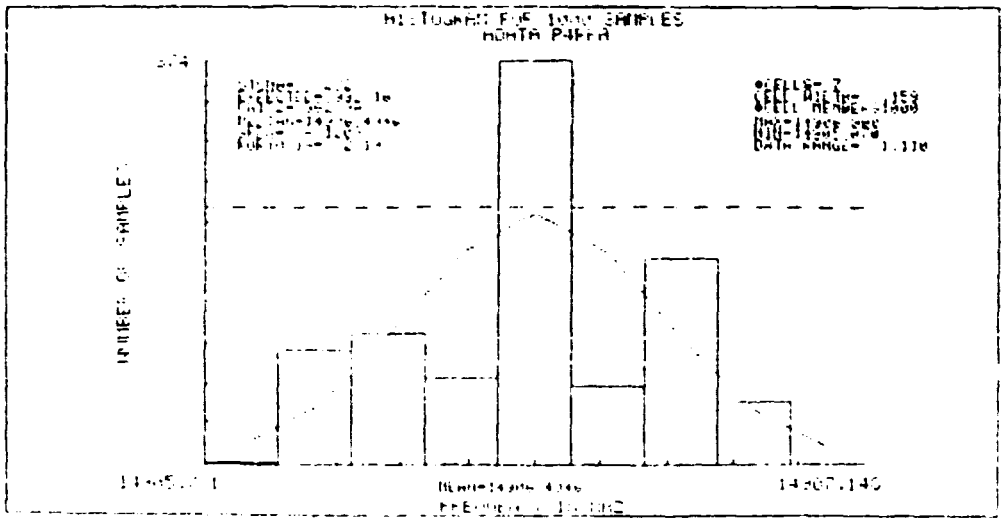
The statistical results of the frequency sampled data P4RFA are presented on the next three pages. Histogram time plots, histograms, and statistical analysis are presented.

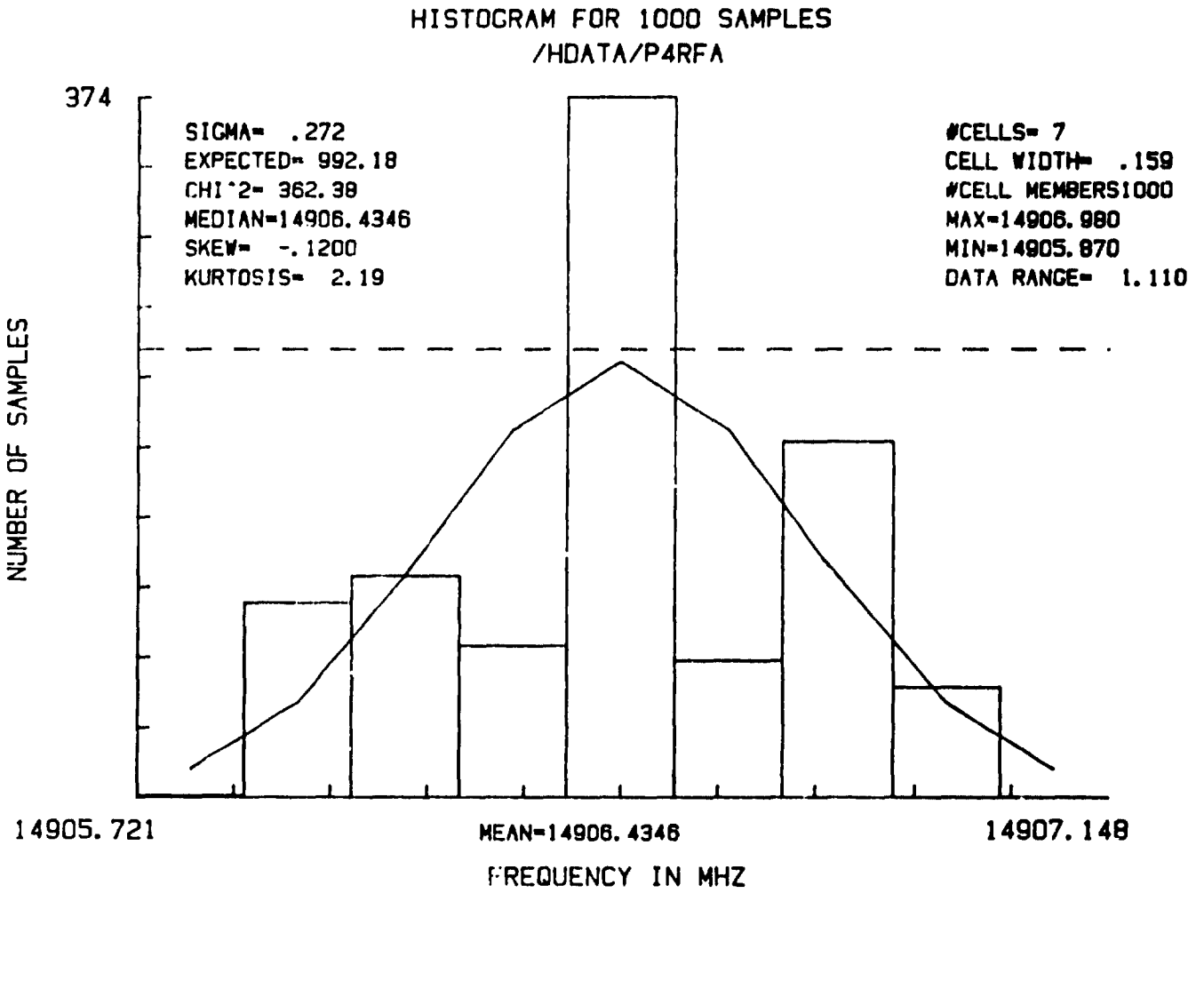
The test results section of this report contains summary statistical information associated with this frequency data set.

```
[illegible] NAME /HDATA/PAIR ASTART TIME 1514:47:3405/09/14
MEAN 14906.4346
MAX VALUE=14906.9800   MIN VALUE=14905.8700   RANGE=    1.11
SIGMA=  .2721
COEFFICENT OF SKEWNESS=  -.1200
COEFFICIENT OF KURTOSIS= 2.1872
OUT-OF-RANGE DATA POINTS=  0 POINTS
```




```
IF NI= 5   CW= .221999999999753
IF NI= 7   CW= .158571428571252
IF NI= 9   CW= .123333333333196
IF NI= 11   CW= .100909090908978
IF NI= 13   CW= .0853846153845202
IF NI= 15   CW= .0739999999999175
IF NI= 17   CW= .0652941176469861
IF NI= 19   CW= .0584210526315138
IF NI= 21   CW= .0526571428570B4
IF NI= 23   CW= .0482608695651636
IF NI= 25   CW= .0443999999999505
IF NI= 27   CW= .0411111111110653
HPLOT EXECUTION TIME=  4.30MINUTES.
```




HISTOGRAM FOR 1000 SAMPLES
/HDATA/P4RFA
374
SIGMA= .272
EXPECTED= 992.18
CHI^2= 362.38
MEDIAN=14906.4346
SKEW= -.1200
KURTOSIS= 2.19
#CELLS= 7
CELL WIDTH= .159
#CELL MEMBERS1000
MAX=14906.980
MIN=14905.870
DATA RANGE= 1.110
NUMBER OF SAMPLES
14905.721
MEAN=14906.4346
14907.148
FREQUENCY IN MHZ

FILE /HDATA/P4RFA

PLOT MIN=14905.7210 PLOT MAX=14907.1482
DATA MIN=14905.8700 DATA MAX=14906.9000

CELL #	CENTER	# SAMPLES	EXPECTED
1	14905.8003	1	15.366
2	14905.9589	104	50.436
3	14906.1174	118	117.876
4	14906.2760	81	196.174
5	14906.4346	374	232.476
6	14906.5932	73	196.174
7	14906.7517	190	117.876
8	14906.9103	59	50.436
9	14907.0689	0	15.366

MEAN VALUE=14906.4346
STANDARD DEVIATION= .2721
COEFF OF SKEWNESS= -.1200
COEFF OF KURTOSIS= 2.1872
CHI-SQUARED= 362.3809
MEDIAN X VALUE=14906.4346
CELL WIDTH= .158571
PLOT RANGE= 1.4271
SUM ACTUAL=1000
SUM EXPECTED= 992.1798
56.1PERCENT OF DATA LIES BETWEEN 14906.2760 AND14906.5932

Average Frequency Sampled Data - P4RFB

The statistical results of the frequency sampled data P4RFB are presented on the next three pages. Histogram time plots, histograms, and statistical analysis are presented.

The test results section of this report contains summary statistical information associated with this frequency data set.

FILE=RAL/RUNTIM/P4B DATA1 TITLE IS:[illegible]

MEAN=15011.6618

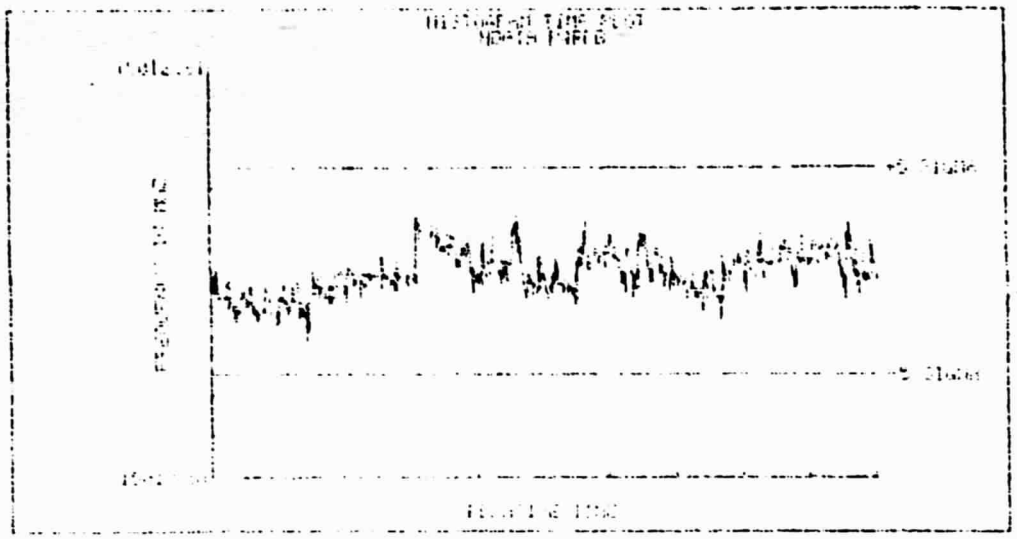
MAX VALUE=15011.9766 MIN VALUE=15011.2890 RANGE= .69

SIGMA= .1166

COEFFICIENT OF SKEWNESS= -.0193

COEFFICIENT OF KURTOSIS= 2.6854

OUT-OF-RANGE DATA POINTS= 0 POINTS



IF NI= 9 CU= .[illegible]

IF NI= 11 CU= .0827777777777319

IF NI= 13 CU= .05307057307780973

IF NI= 15 CU= .[illegible]

IF NI= 17 CU= .[illegible]

IF NI= 19 CU= .[illegible]

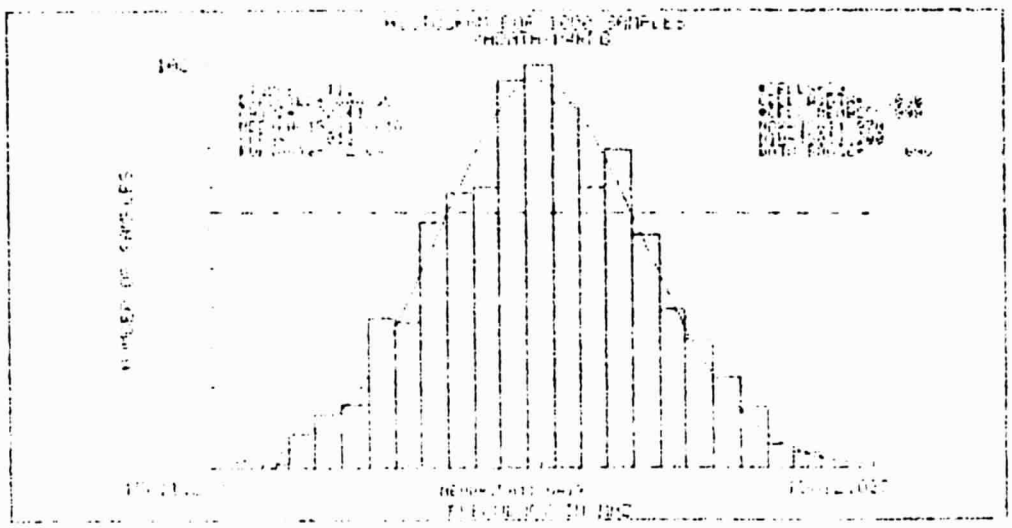
IF NI= 21 CU= .03705214706771071

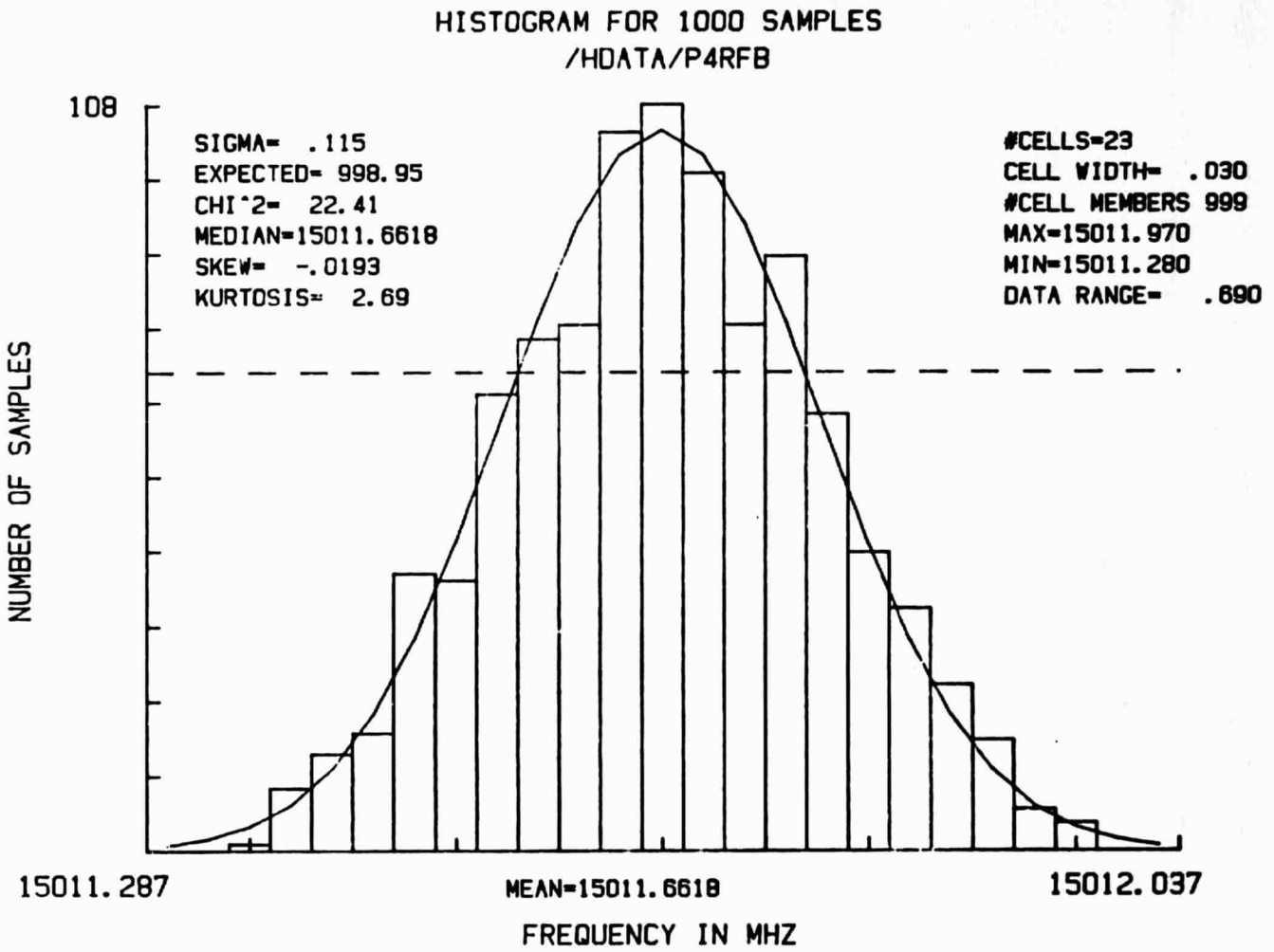
IF NI= 23 CU= .[illegible]

IF NI= 25 CU= .[illegible]

IF NI= 27 CU= .[illegible]

PLOT EXECUTION TIME= 7.53000001 SECONDS.




HISTOGRAM FOR 1000 SAMPLES
/HDATA/P4RFB
108
SIGMA= .115
EXPECTED= 998.95
CHI^2= 22.41
MEDIAN=15011.6618
SKEW= -.0193
KURTOSIS= 2.69
#CELLS=23
CELL WIDTH= .030
#CELL MEMBERS 999
MAX=15011.970
MIN=15011.280
DATA RANGE= .690
NUMBER OF SAMPLES
15011.287
MEAN=15011.6618
15012.037
FREQUENCY IN MHZ

FILL /HEADER/PAGED

PLOT MIN=15011.2868 PLOT MAX=15012.0358
DATA MIN=15011.2800 DATA MAX=15011.9700

CELL #	CENTER	# SAMPLES	EXPECTED
1	15011.3018	0	.763
2	15011.3318	0	1.674
3	15011.3618	1	3.429
4	15011.3918	9	6.560
5	15011.4218	14	11.723
6	15011.4518	17	19.564
7	15011.4818	40	30.490
8	15011.5118	39	44.398
9	15011.5418	66	60.370
10	15011.5718	71	76.671
11	15011.6018	76	90.944
12	15011.6318	104	100.754
13	15011.6618	100	104.254
14	15011.6918	98	100.754
15	15011.7218	76	90.944
16	15011.7518	86	76.671
17	15011.7818	63	60.370
18	15011.8118	43	44.398
19	15011.8418	35	30.490
20	15011.8718	24	19.564
21	15011.9018	10	11.723
22	15011.9318	5	6.560
23	15011.9618	4	3.429
24	15011.9918	0	1.674
25	15012.0218	0	.763

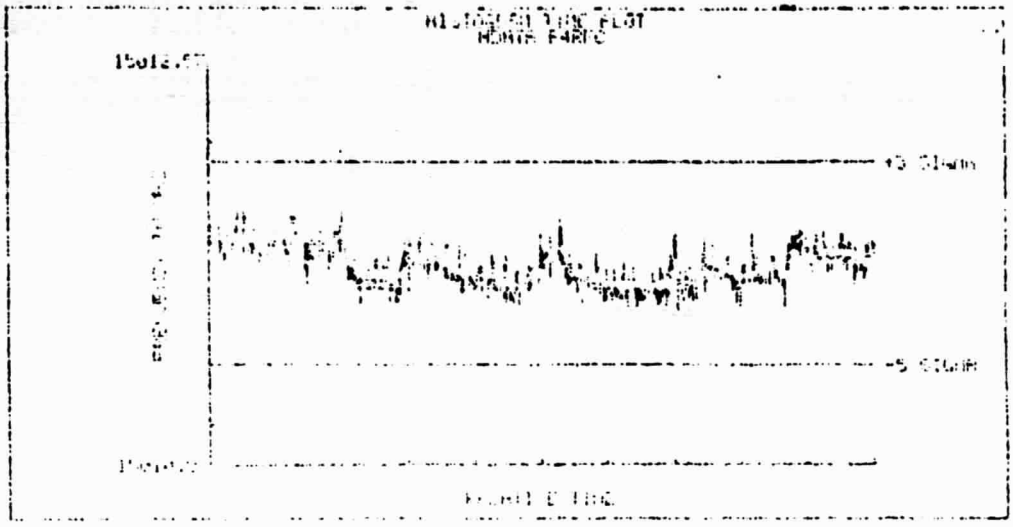
MEAN VALUE=15011.6618
STANDARD DEVIATION= .1148
COEFF OF SKEWNESS= -.0193
COEFF OF KURTOSIS= 2.6654
CHI-SQUARED= 22.4114
MEDIAN X VALUE=15011.6618
CELL WIDTH= .030000
PLOT BASE= .7500
SUM ACTUAL= 999
SUM EXPECTED= 998.9460
62.3 PERCENT OF DATA FELL BETWEEN 15011.5718 AND15011.7518

Average Frequency Sampled Data - P4RFC

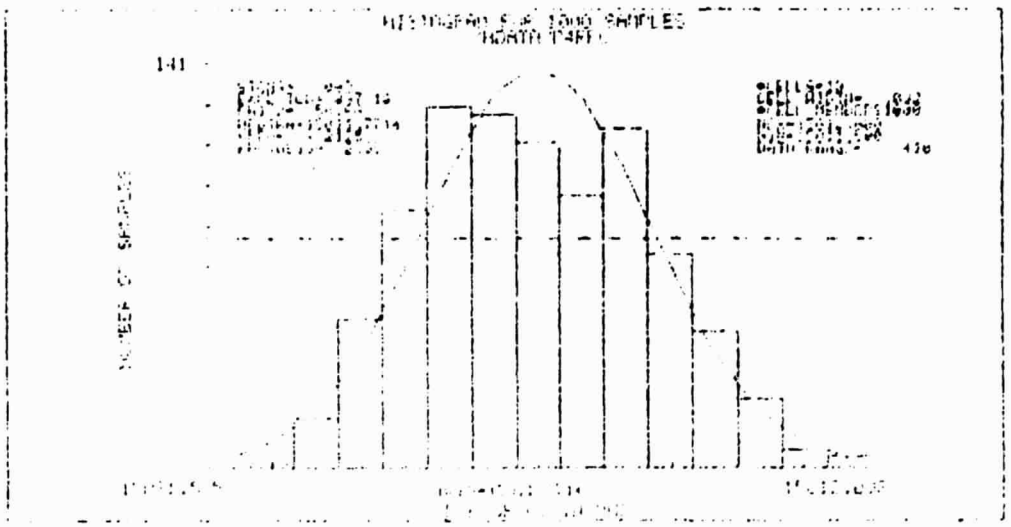
The statistical results of the frequency sampled data P4RFC are presented on the next three pages. Histogram time plots, histograms, and statistical analysis are presented.

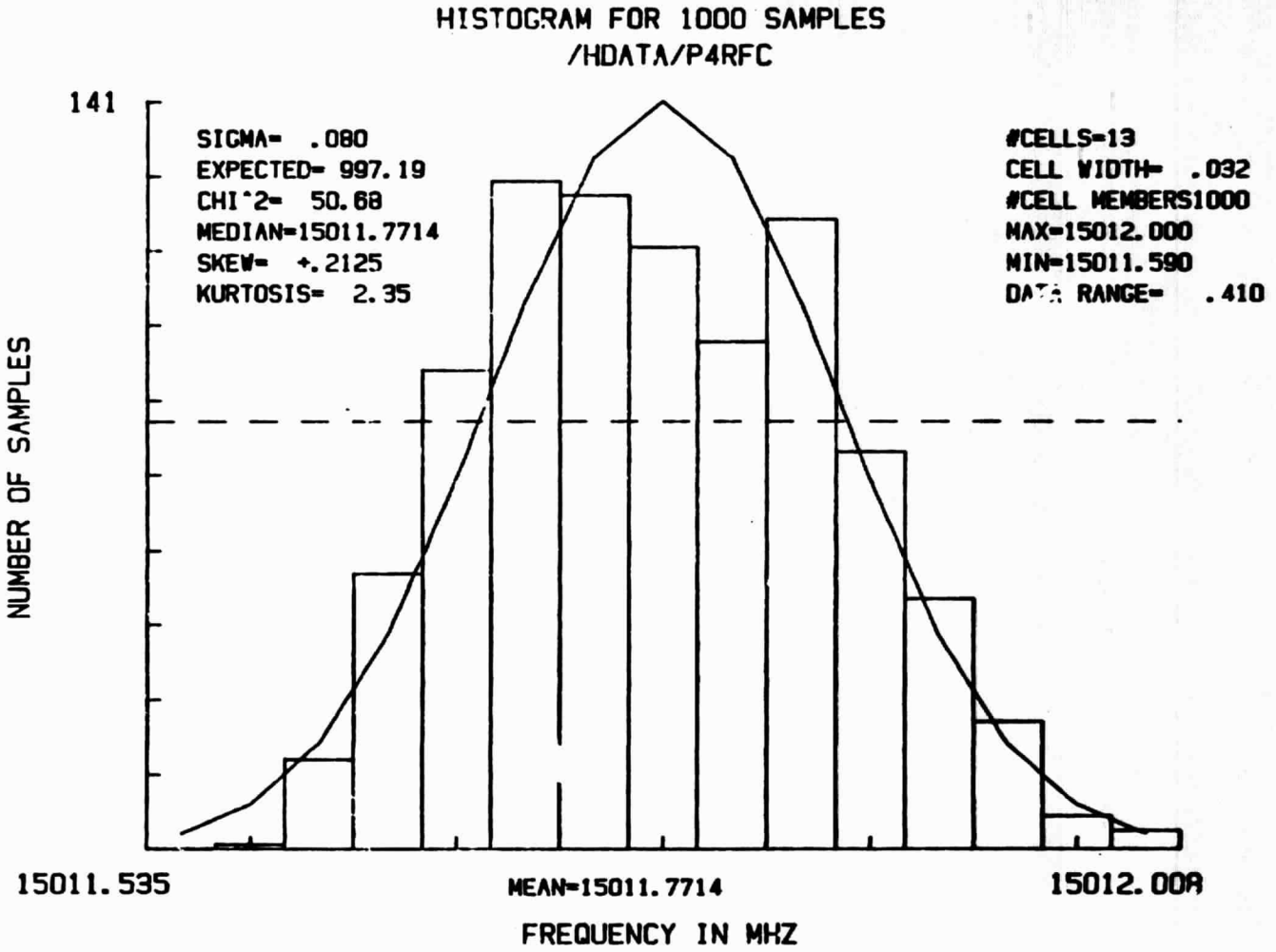
The test results section of this report contains summary statistical information associated with this frequency data set.

FILENAME/PATH/PATTERN/STATS Time 15:29:16 05/03/93
MEAN 15011.7714
MAX VALUE= 15012.0000 MIN VALUE= 15011.5860 RANGE= .41
SIGMA= .0797
COEFFICIENT OF SKEWNESS= 1.2125
COEFFICIENT OF KURTOSIS= 2.3533
OUT-OF-RANGE DATA POINTS= 0 POINTS



IF N1= 9 CV= .0[illegible]
IF N1= 11 CV= .03727272727214
IF N1= 13 CV= .0315384615385[illegible]
IF N1= 15 CV= .02733333333[illegible]
IF N1= 17 CV= .0241176470[illegible]
IF N1= 19 CV= .0215789473[illegible]
IF N1= 21 CV= .0195238[illegible]
IF N1= 23 CV= .0176[illegible]
IF N1= 25 CV= .0163[illegible]
IF N1= 27 CV= .01[illegible]
HPLOT EXECUTION TIME= 8.32[illegible] MINUTES.




HISTOGRAM FOR 1000 SAMPLES
/HDATA/P4RFC
141
SIGMA= .080
EXPECTED= 997.19
CHI^2= 50.68
MEDIAN=15011.7714
SKEW= +.2125
KURTOSIS= 2.35
#CELLS=13
CELL WIDTH= .032
#CELL MEMBERS1000
MAX=15012.000
MIN=15011.590
DATA RANGE= .410
NUMBER OF SAMPLES
15011.535
MEAN=15011.7714
15012.008
FREQUENCY IN MHZ

FILE /Users/PARC

PLOT MIN=15011.5349 PLOT MAX=15012.0080
DATA MIN=15011.5866 DATA MAX=15012.0366

CELL #	CENTER	# SAMPLES	EXPECTED
1	15011.5507	0	3.401
2	15011.5822	1	9.414
3	15011.6138	19	22.283
4	15011.6453	50	45.084
5	15011.6768	101	78.074
6	15011.7084	141	115.428
7	15011.7399	138	146.003
8	15011.7714	127	157.898
9	15011.8030	107	146.003
10	15011.8345	133	115.428
11	15011.8661	84	78.074
12	15011.8976	53	45.084
13	15011.9291	27	22.283
14	15011.9607	7	9.414
15	15011.9922	4	3.401

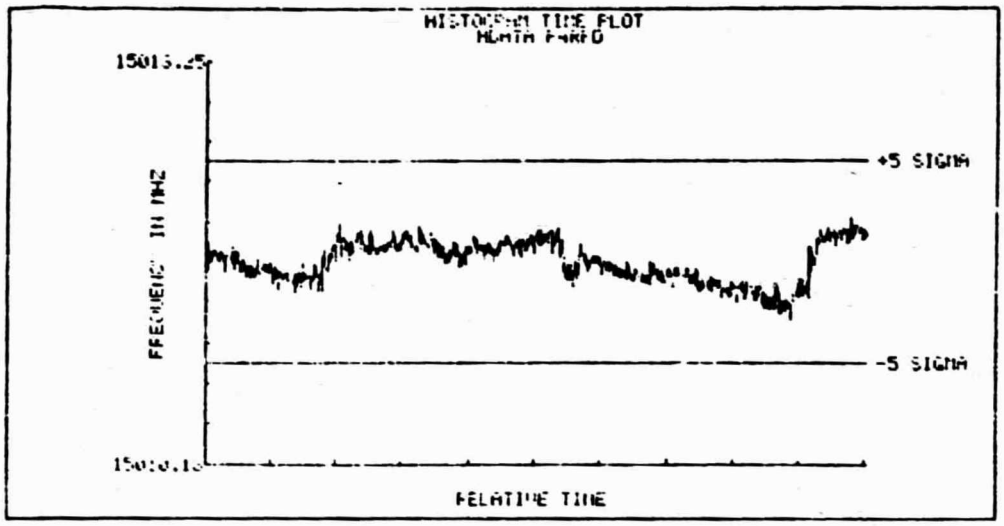
MEAN VALUE=15011.7714
STANDARD DEVIATION= .0797
COEFF OF SKEWNESS= 1.2125
COEFF OF KURTOSIS= 2.3533
CHI SQUARED= 58.6761
MEDIAN X VALUE=15011.7714
CELL WIDTH= .031538
PLOT RANGE= .4731
SUM ACTUAL=1030
SUM EXPECTED= 957.1906
95.3PERCENT OF DATA FALLS BETWEEN 15011.7084 AND15011.8345

Average Frequency Sampled Data - P4RFD

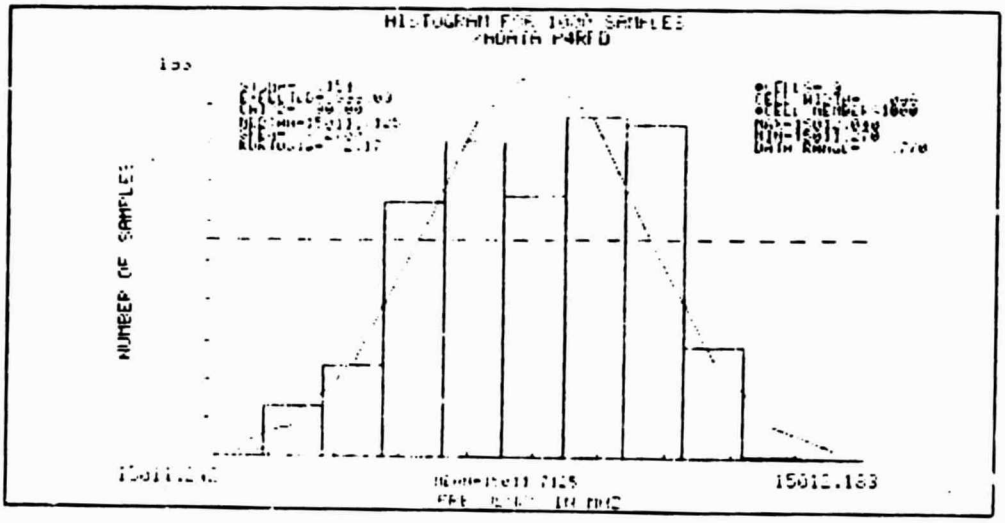
The statistical results of the frequency sampled data P4RFD are presented on the next three pages. Histogram time plots, histograms, and statistical analysis are presented.

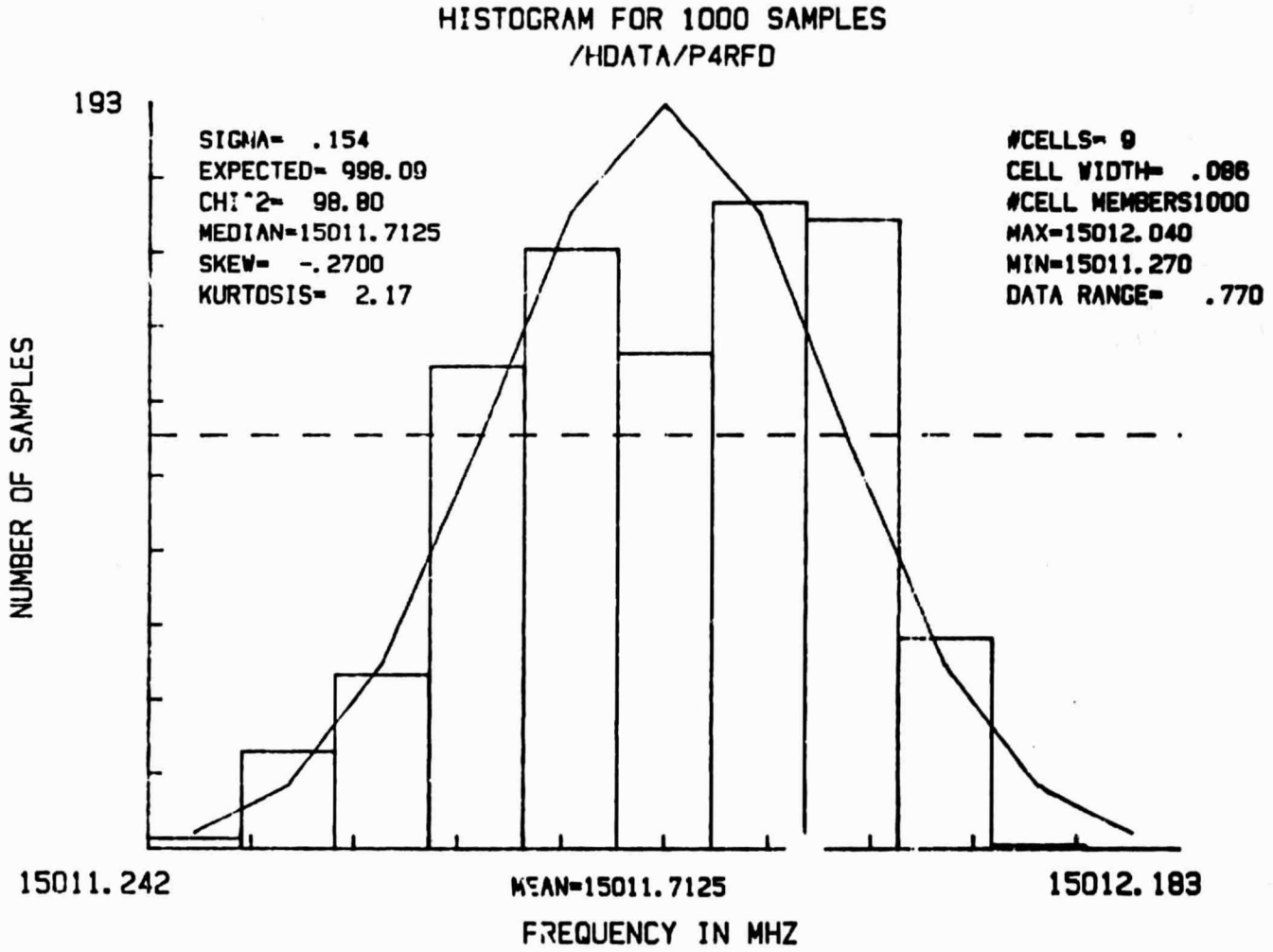
The test results section of this report contains summary statistical information associated with this frequency data set.

```
FILENAME/HDATA/P4RHDSTART [illegible] 15:05:4985/09/14
MEAN=15011.7125
MAX VALUE=15012.0400   MIN VALUE=15011.2700   RANGE=      .77
SIGMA=  .1536
COEFFICENT OF SKEWNESS=  -.2700
COEFFICIENT OF KURTOSIS= 2.1697
OUT-OF-RANGE DATA POINTS=  0 POINTS
```




```
IF NI= 5   CW= .154000000000087
IF NI= 7   CW= .110000000000062
IF NI= 9   CW= .085555555555C041
IF NI= 11   CW= .070000000000397
IF NI= 13   CW= .0592307692300028
IF NI= 15   CW= .0513333333333624
IF NI= 17   CW= .045294117647C845
IF NI= 19   CW= .0405263157894907
IF NI= 21   CW= .036666666666875
IF NI= 23   CW= .0334782608695842
IF NI= 25   CW= .030000000000175
IF NI= 27   CW= .0285185185185347
HPLOT EXECUTION TIME=  5.22MINUTES.
```




HISTOGRAM FOR 1000 SAMPLES
/HDATA/P4RFD
193
SIGMA= .154
EXPECTED= 998.09
CHI^2= 98.80
MEDIAN=15011.7125
SKEW= -.2700
KURTOSIS= 2.17
#CELLS= 9
CELL WIDTH= .086
#CELL MEMBERS1000
MAX=15012.040
MIN=15011.270
DATA RANGE= .770
NUMBER OF SAMPLES
15011.242
MEAN=15011.7125
15012.183
FREQUENCY IN MHZ

FILE /HDATA/P4RFD

PLOT MIN=15011.2419 PLOT MAX=15012.1831
DATA MIN=15011.2700 DATA MAX=15012.0400

CELL #	CENTER	# SAMPLES	EXPECTED
1	15011.2847	3	4.595
2	15011.3703	29	18.565
3	15011.4558	52	55.000
4	15011.5414	144	119.475
5	15011.6269	179	190.293
6	15011.7125	148	222.232
7	15011.7981	193	190.293
8	15011.8836	188	119.475
9	15011.9692	63	55.000
10	15012.0547	1	18.565
11	15012.1403	0	4.595

MEAN VALUE=15011.7125
STANDARD DEVIATION= .1536
COEFF OF SKEWNESS= -.2700
COEFF OF KURTOSIS= 2.1697
CHI-SQUARED= 98.8008
MEDIAN X VALUE=15011.7125
CELL WIDTH= .085556
PLOT RANGE= .9411
SUM ACTUAL=1000
SUM EXPECTED= 998.0873
70.9PERCENT OF DATA LIES BETWEEN 15011.6269 AND15011.8836

APPENDIX F

INTRODUCTION

ELINT parameter test results are contained in this appendix for the averaged pulsewidth parameter associated with the HOOD radar. These measurements were performed with the Microwave Counter sensor. The pulse data sets are labelled:

P3PWA

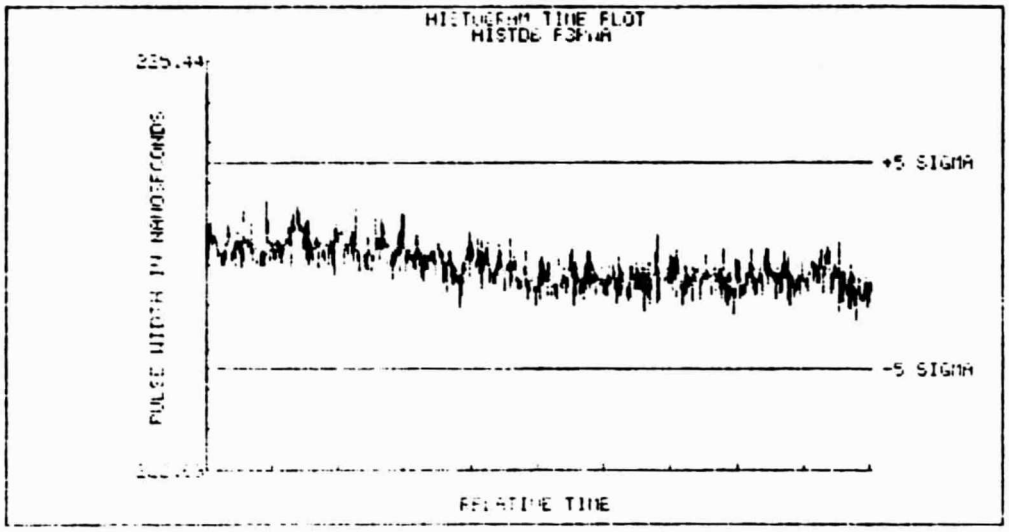
P3PWB

Average Pulsewidth Sampled Data - P3PWA

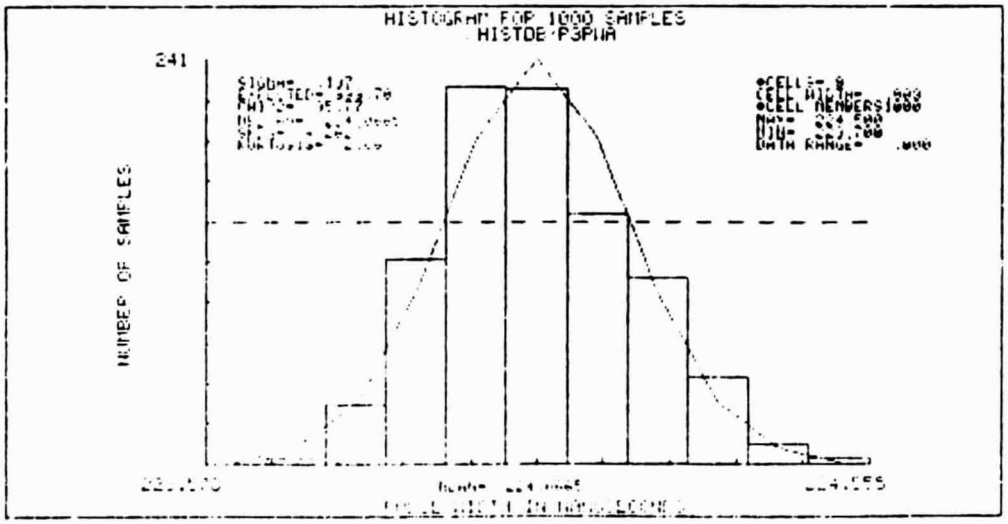
The statistical results of the average pulsewidth sampled data P3PWA are presented on the next three pages. Histogram time plots, histograms, and statistical analysis are presented.

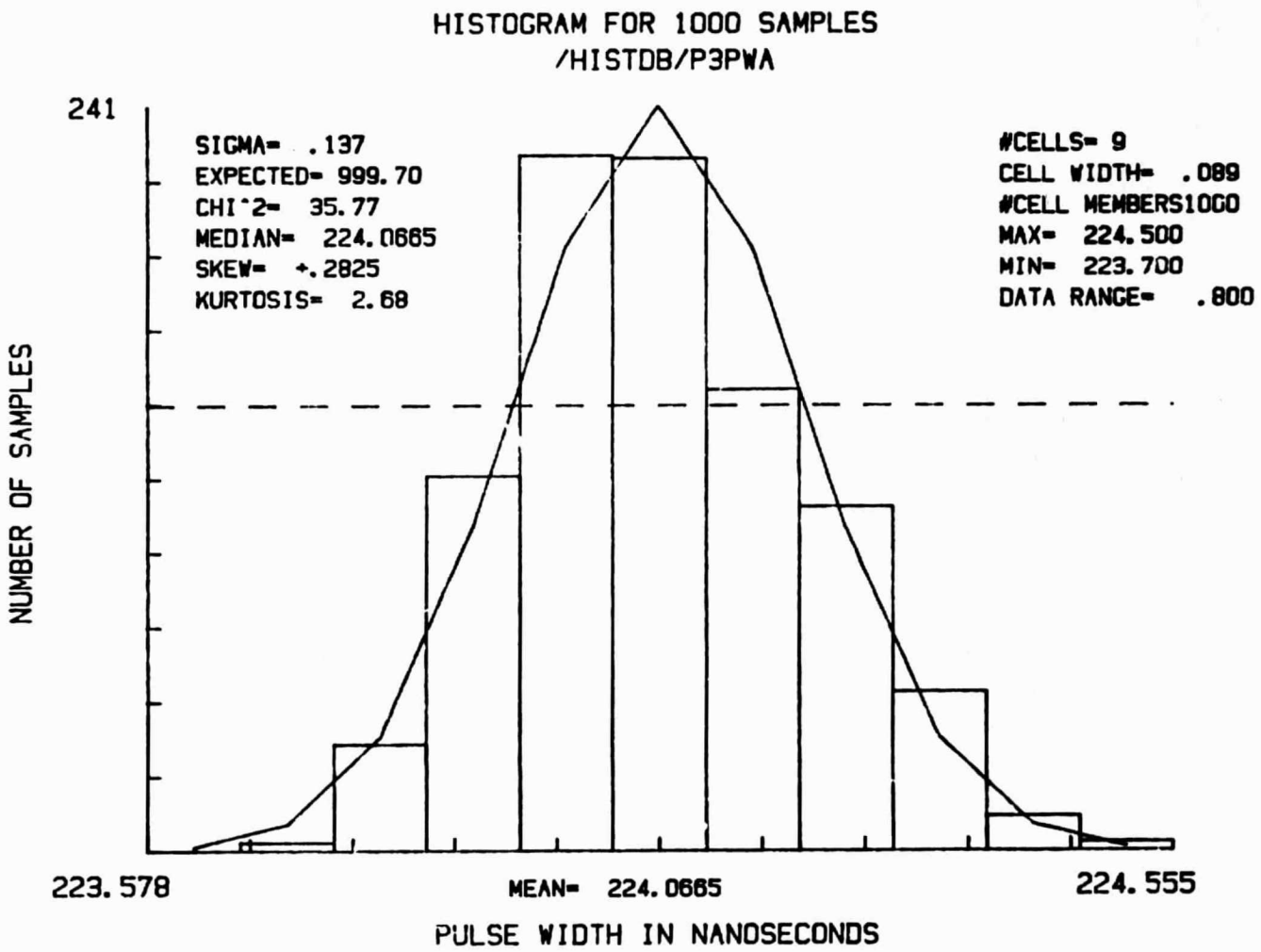
The test results section of this report contains summary statistical information associated with this pulsewidth data set.

FILENAME/DESCRIPTION: P3PWA START TIME [SIS:27:2005/09/14
MEAN= 224.0065
MAX VALUE= 224.5000 MIN VALUE= 223.7000 RANGE= .80
SIGMA= .1375
COEFFICIENT OF SKEWNESS= +.2025
COEFFICIENT OF KURTOSIS= 2.6755
OUT-OF-RANGE DATA POINTS= 0 POINTS



IF N1= 5 CW= .159999999999997
IF N1= 7 CW= .114285714285717
IF N1= 9 CW= .088888888888887
IF N1= 11 CW= .0727272727272712
IF N1= 13 CW= .0615384615384602
IF N1= 15 CW= .0533333333333322
IF N1= 17 CW= .0470588235294128
IF N1= 19 CW= .0421052631578938
IF N1= 21 CW= .0380952380952373
IF N1= 23 CW= .0347826086956514
IF N1= 25 CW= .0319999999999993
IF N1= 27 CW= .0296296296296279
HPLOT EXECUTION TIME= 6.07MINUTES.




HISTOGRAM FOR 1000 SAMPLES
/HISTDB/P3PWA
241
SIGMA= .137
EXPECTED= 999.70
CHI^2= 35.77
MEDIAN= 224.0665
SKEW= +.2825
KURTOSIS= 2.68
#CELLS= 9
CELL WIDTH= .089
#CELL MEMBERS1000
MAX= 224.500
MIN= 223.700
DATA RANGE= .800
NUMBER OF SAMPLES
223.578
MEAN= 224.0665
224.555
PULSE WIDTH IN NANOSECONDS

FILE /HISTOG/P3PWA

PLOT MIN= 223.5776 PLOT MAX= 224.5554
DATA MIN= 223.7000 DATA MAX= 224.5000

CELL #	CENTER	# SAMPLES	EXPECTED
1	223.6220	0	1.387
2	223.7109	3	9.099
3	223.7998	37	39.309
4	223.8887	130	111.790
5	223.9776	241	209.291
6	224.0665	240	257.949
7	224.1554	160	209.291
8	224.2443	119	111.790
9	224.3332	55	39.309
10	224.4220	12	9.099
11	224.5109	3	1.387

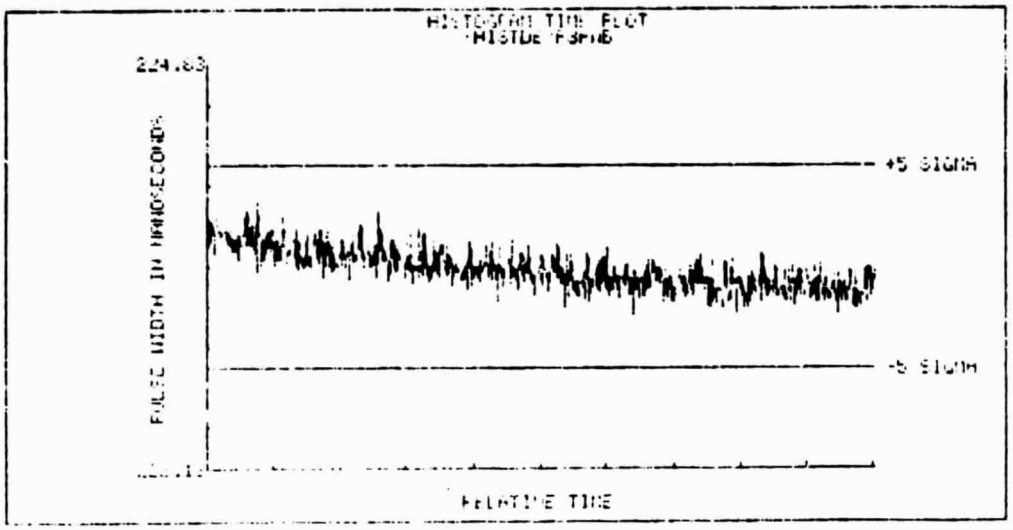
MEAN VALUE= 224.0665
STANDARD DEVIATION= .1375
COEFF OF SKEWNESS= +.2825
COEFF OF KURTOSIS= 2.6755
CHI-SQUARED= 35.7688
MEDIAN X VALUE= 224.0665
CELL WIDTH= .088889
PLOT RANGE= .9778
SUM ACTUAL=1000
SUM EXPECTED= 999.7025
65.1PERCENT OF DATA LIES BETWEEN 223.9776 AND 224.1554

Average Pulsewidth Sampled Data - P3PWB

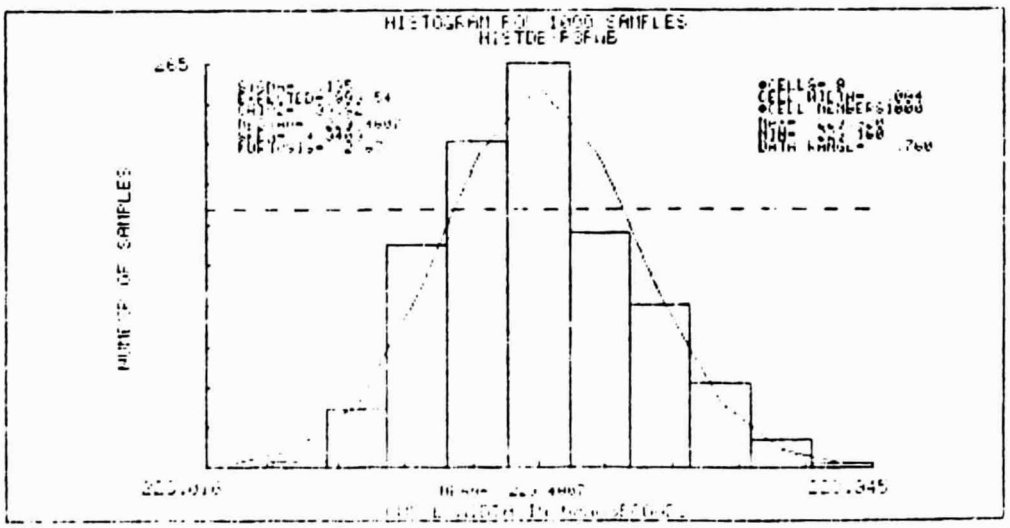
The statistical results of the average pulsewidth sampled data P3PWB are presented on the next three pages. Histogram time plots, histograms, and statistical analysis are presented.

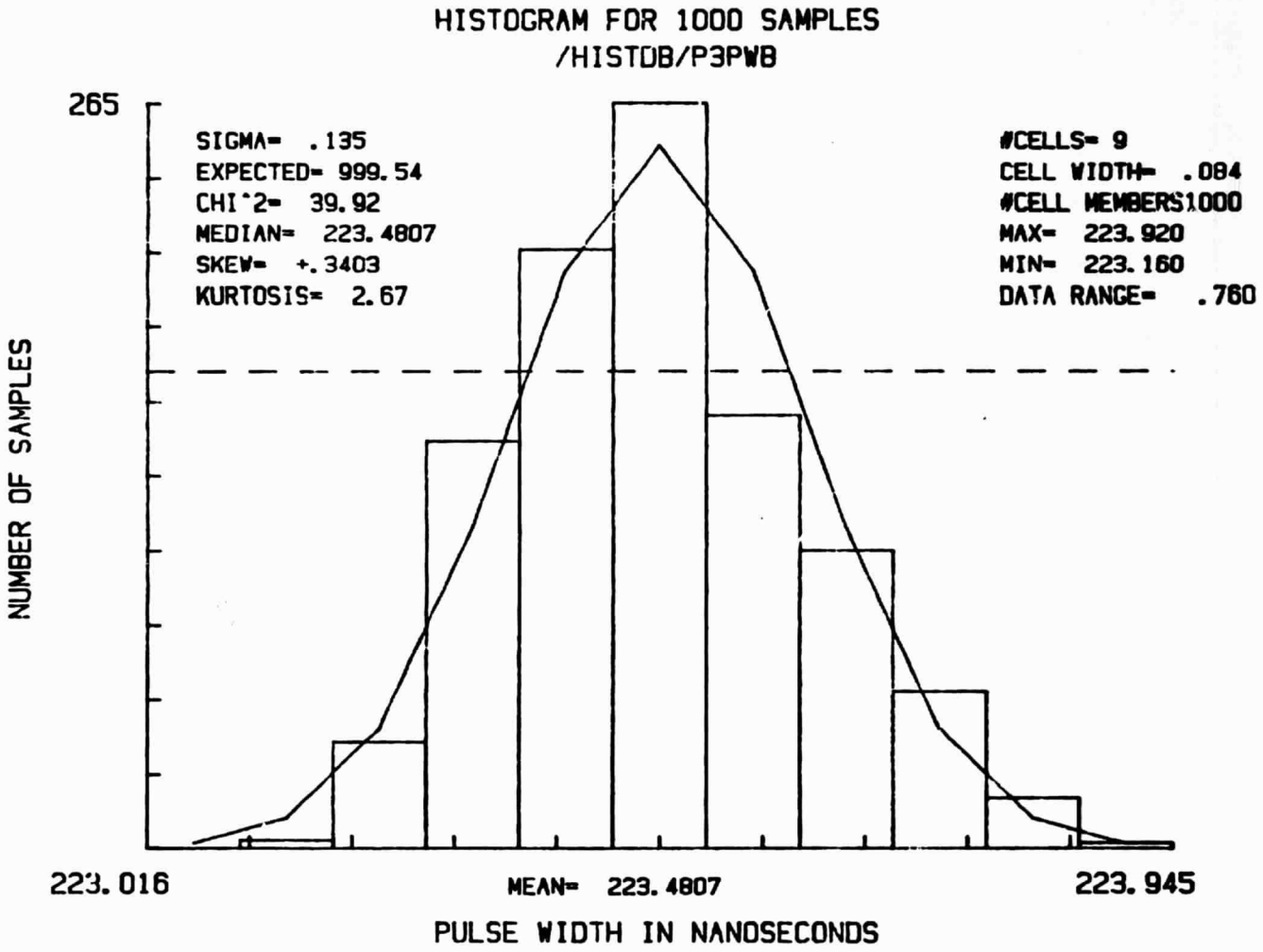
The test results section of this report contains summary statistical information associated with this pulsewidth data set.

MEAN= 223.4807
MAX VALUE= 223.9200 MIN VALUE= 223.1600 RANGE= .76
SIGMA= .1348
COEFFICENT OF SKEWNESS= 4.3403
COEFFICIENT OF KURTOSIS= 2.0656
OUT-OF-RANGE DATA POINTS= 0 POINTS



IF N1= 5 CW= .1519999999999998
IF N1= 7 CW= .1065714285571427
IF N1= 9 CW= .0844444411444434
IF N1= 11 CW= .0699629090929063
IF N1= 13 CW= .0584615384615378
IF N1= 15 CW= .0500000000000001
IF N1= 17 CW= .0447058823529406
IF N1= 19 CW= .0399999999999995
IF N1= 21 CW= .0361904761904758
IF N1= 23 CW= .0330434782600692
IF N1= 25 CW= .0303599999999996
IF N1= 27 CW= .0281481481481478
NPLOT EXECUTION TIME= 4.60MINUTES.




HISTOGRAM FOR 1000 SAMPLES
/HISTDB/P3PWB
265
SIGMA= .135
EXPECTED= 999.54
CHI^2= 39.92
MEDIAN= 223.4807
SKEW= +.3403
KURTOSIS= 2.67
#CELLS= 9
CELL WIDTH= .084
#CELL MEMBERS1000
MAX= 223.920
MIN= 223.160
DATA RANGE= .760
NUMBER OF SAMPLES
223.016
MEAN= 223.4807
223.945
PULSE WIDTH IN NANOSECONDS

FILE /HIST0B/P3PWB

PLOT MIN= 223.0162 PLOT MAX= 223.9451
DATA MIN= 223.1600 DATA MAX= 223.9200

CELL #	CENTER	# SAMPLES	EXPECTED
1	223.0584	0	1.856
2	223.1429	3	10.839
3	223.2273	38	42.772
4	223.3118	145	114.025
5	223.3962	213	205.354
6	223.4807	265	249.845
7	223.5651	154	205.354
8	223.6495	106	114.025
9	223.7340	56	42.772
10	223.8184	18	10.839
11	223.9029	2	1.856

MEAN VALUE= 223.4807
STANDARD DEVIATION= .1348
COEFF OF SKEWNESS= +.3403
COEFF OF KURTOSIS= 2.6656
CHI-SQUARED= 39.9164
MEDIAN X VALUE= 223.4807
CELL WIDTH= .084344
PLOT RANGE= .9289
SUM ACTUAL=1000
SUM EXPECTED= 999.5354
64.5PERCENT OF DATA LIES BETWEEN 223.3962 AND 223.5651

APPENDIX G

INTRODUCTION

ELINT parameter test results are contained in this appendix for the single pulse frequency parameter associated with the PPS-6 radar. These measurements were performed with the IFM sensor. The single pulse frequency data sets are labelled :

P1SNABCD

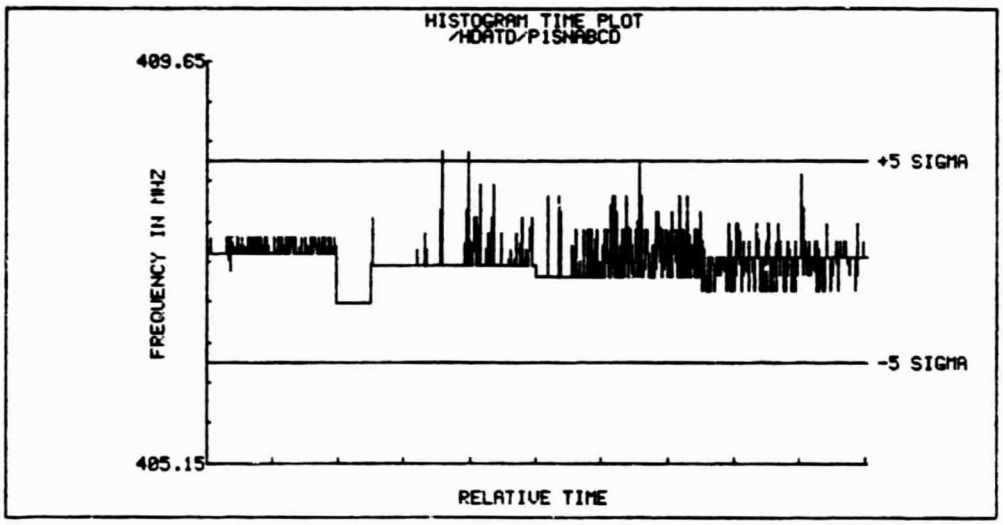
P1SNCDEF

Frequency Sampled Data - P1SNABCD

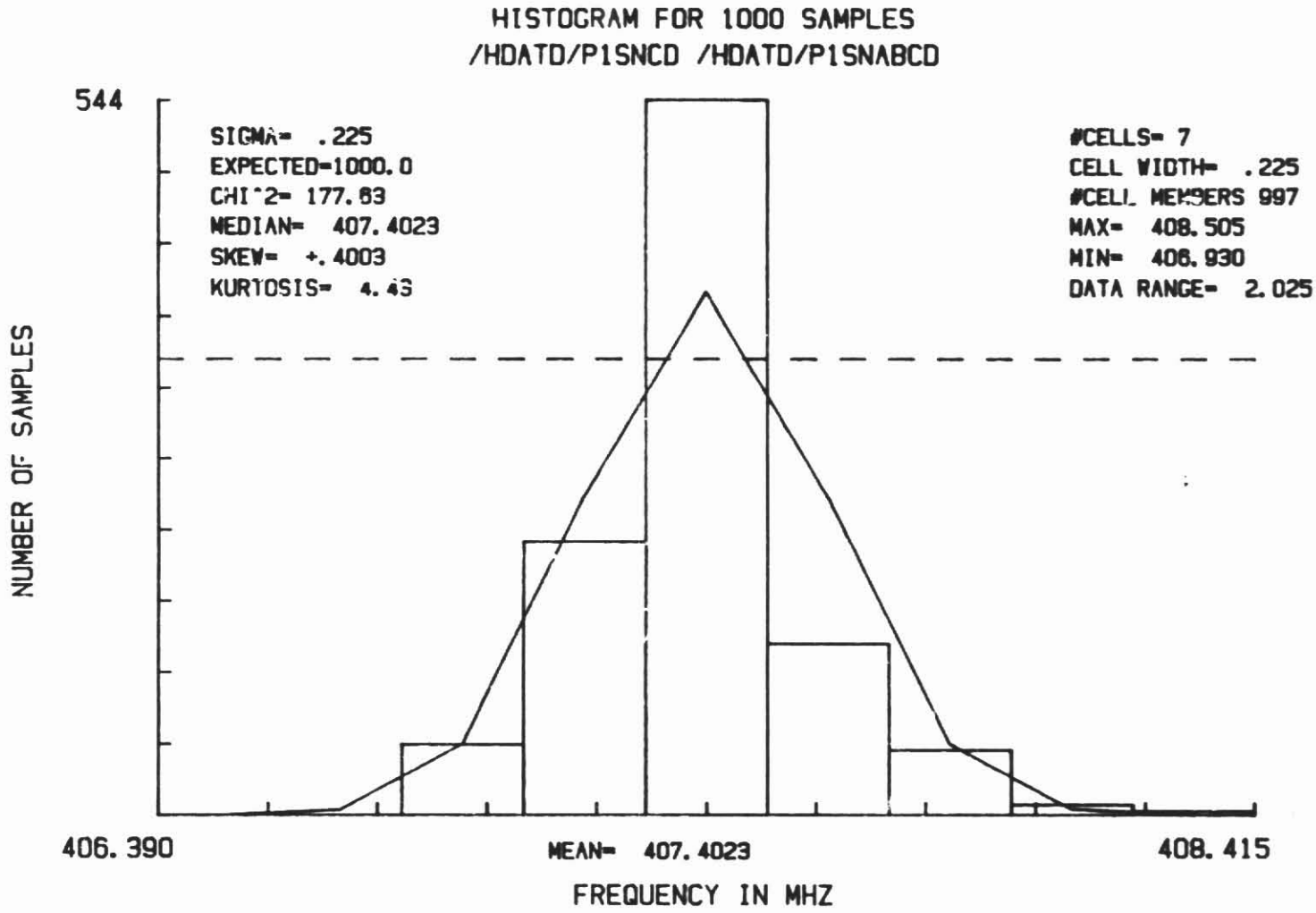
The statistical results of the single pulse frequency sampled data P1SNABCD are presented on the next three pages. Histogram time plots, histograms, and statistical analysis are presented.

The test results section of this report contain summary statistical information associated with this frequency data set.

FILENAME/HDATD/P1SNABCD START TIME IS14:02:1085/09/15
MEAN= 407.4023
MAX VALUE= 408.6380 MIN VALUE= 406.9300 RANGE= 1.71
SIGMA= .2252
COEFFICENT OF SKEWNESS= +.4003
COEFFICIENT OF KURTOSIS= 4.4337
OUT-OF-RANGE DATA POINTS= 2 POINTS



IF N1= 5 CW= .31496800000042
IF N1= 7 CW= .224977142857443
IF N1= 9 CW= .174982222222455
IF N1= 11 CW= .143167272727463
IF N1= 13 CW= .1211415384617
IF N1= 15 CW= .104989333333473
IF N1= 17 CW= .092637647058946 9
IF N1= 19 CW= .082886315789584 1
IF N1= 21 CW= .0749923809524809
IF N1= 23 CW= .0684713043479173
IF N1= 25 CW= .062993600000083 9
IF N1= 27 CW= .0583274074074851


HISTOGRAM FOR 1000 SAMPLES
/HDATD/P1SNCD /HDATD/P1SNABCD
544
SIGMA= .225
EXPECTED=1000.0
CHI^2= 177.83
MEDIAN= 407.4023
SKEW= +.4003
KURTOSIS= 4.43
#CELLS= 7
CELL WIDTH= .225
#CELL MEMBERS 997
MAX= 408.505
MIN= 406.930
DATA RANGE= 2.025
NUMBER OF SAMPLES
406.390
MEAN= 407.4023
408.415
FREQUENCY IN MHZ

FILE /HDATD/P1SNABCD

PLOT MIN= 406.3899 PLOT MAX= 408.4147
DATA MIN= 406.9300 DATA MAX= 408.5048

CELL #	CENTER	# SAMPLES	EXPECTED
1	406.5024	0	.136
2	406.7273	0	4.475
3	406.9523	54	54.187
4	407.1773	208	241.970
5	407.4023	544	398.461
6	407.6273	130	241.970
7	407.8522	50	54.187
8	408.0772	8	4.475
9	408.3022	3	.136

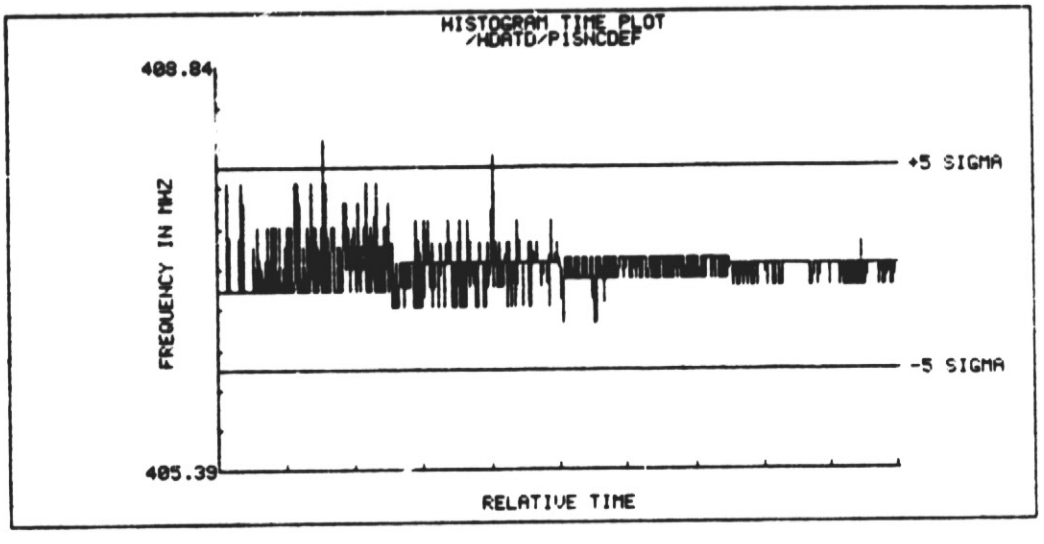
MEAN VALUE= 407.4023
STANDARD DEVIATION= .2252
COEFF OF SKEWNESS= +.4003
COEFF OF KURTOSIS= 4.4337
CHI-SQUARED= 177.6337
MEDIAN X VALUE= 407.4023
CELL WIDTH= .224977
PLOT RANGE= 2.0248
SUM ACTUAL= 997
SUM EXPECTED= 999.9969
76.3PERCENT OF DATA LIES BETWEEN 407.1773 AND 407.4023

Single Pulse Frequency Sampled Data - P1SNCDEF

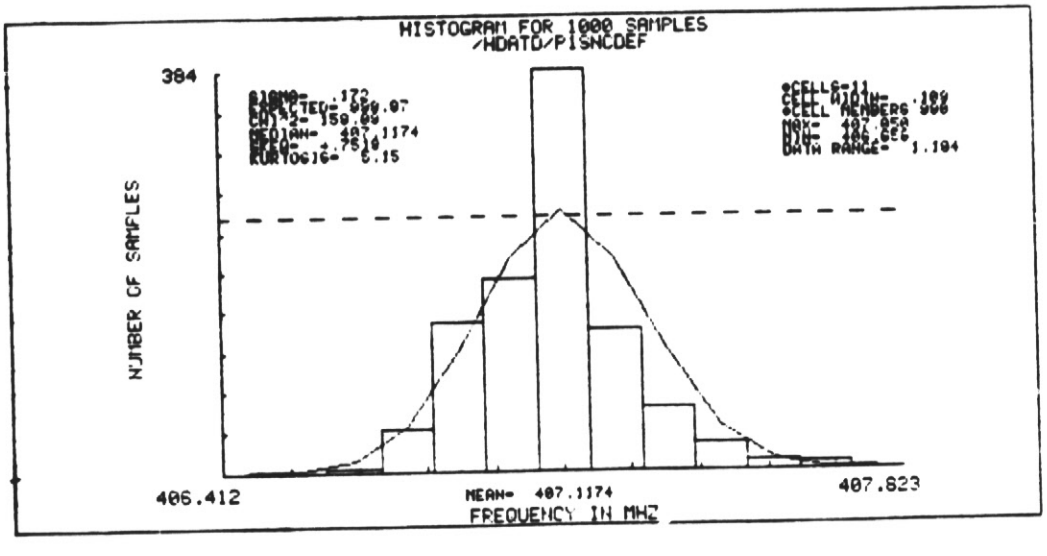
The statistical results of the single pulse frequency sampled data P1SNCDEF are presented on the next three pages. Histogram time plots, histograms, and statistical analysis are presented.

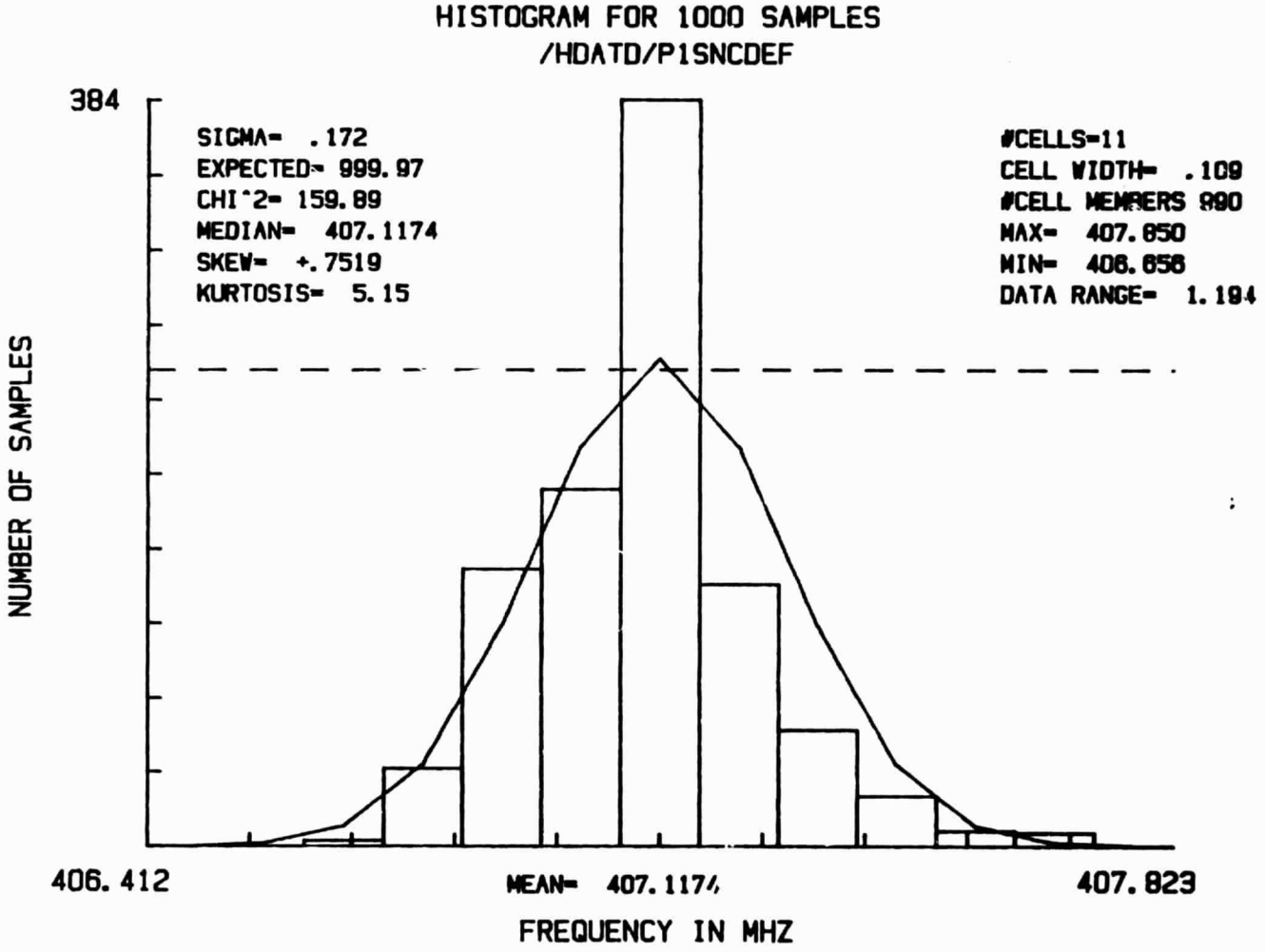
The test results section of this report contain summary statistical information associated with this frequency data set.

FILENAME/HDATD/PISNCDEF START TIME IS14:09:3985/09/15
MEAN= 407.1174
MAX VALUE= 408.2200 MIN VALUE= 406.6562 RANGE= 1.56
SIGMA= .1723
COEFFICENT OF SKEWNESS= +.7519
COEFFICIENT OF KURTOSIS= 5.1488
OUT-OF-RANGE DATA POINTS= 2 POINTS



IF N1= 5 CW= .23875999999932
IF N1= 7 CW= .170542857142371
IF N1= 9 CW= .132644444444067
IF N1= 11 CW= .108527272726964
IF N1= 13 CW= .0918307692305077
IF N1= 15 CW= .07958666666644
IF N1= 17 CW= .0702235294115647
IF N1= 19 CW= .0628315789471895
IF N1= 21 CW= .0568476190474571
IF N1= 23 CW= .0519043478259391
IF N1= 25 CW= .047751999999864
IF N1= 27 CW= .0442148148146889
HPLOT EXECUTION TIME= 4.30MINUTES.




HISTOGRAM FOR 1000 SAMPLES
/HDATD/P1SNCDEF
384
SIGMA= .172
EXPECTED= 999.97
CHI^2= 159.89
MEDIAN= 407.1174
SKEW= +.7519
KURTOSIS= 5.15
#CELLS=11
CELL WIDTH= .109
#CELL MEMBERS 990
MAX= 407.850
MIN= 406.656
DATA RANGE= 1.194
NUMBER OF SAMPLES
406.412
MEAN= 407.1174
407.823
FREQUENCY IN MHZ

FILE ,HDATD/P1SNCDEF

PLOT MIN= 406.4120 PLOT MAX= 407.8229
DATA MIN= 406.6562 DATA MAX= 407.8500

CELL #	CENTER	# SAMPLES	EXPECTED
1	406.4663	0	.199
2	406.5748	0	1.767
3	406.6833	3	10.525
4	406.7919	40	42.173
5	406.9004	143	113.661
6	407.0089	184	206.043
7	407.1174	384	251.231
8	407.2260	135	206.043
9	407.3345	60	113.661
10	407.4430	26	42.173
11	407.5515	8	10.525
12	407.6601	7	1.767
13	407.7686	0	.199

MEAN VALUE= 407.1174
STANDARD DEVIATION= .1723
COEFF OF SKEWNESS= +.7519
COEFF OF KURTOSIS= 5.1488
CHI-SQUARED= 159.8923
MEDIAN X VALUE= 407.1174
CELL WIDTH= .108527
PLOT RANGE= 1.4109
SUM ACTUAL= 990
SUM EXPECTED= 999.9681
57.8PERCENT OF DATA LIES BETWEEN 407.0089 AND 407.1174

APPENDIX H

INTRODUCTION

ELINT parameter test results are contained in this appendix for the single pulse pulsewidth parameter associated with the PPS-6 radar. These measurements were performed with the Microwave Counter sensor in the single pulse measurement mode of operation. The single pulse frequency data sets are labelled :

P1SPWA

P1SPWB

P1SPWC

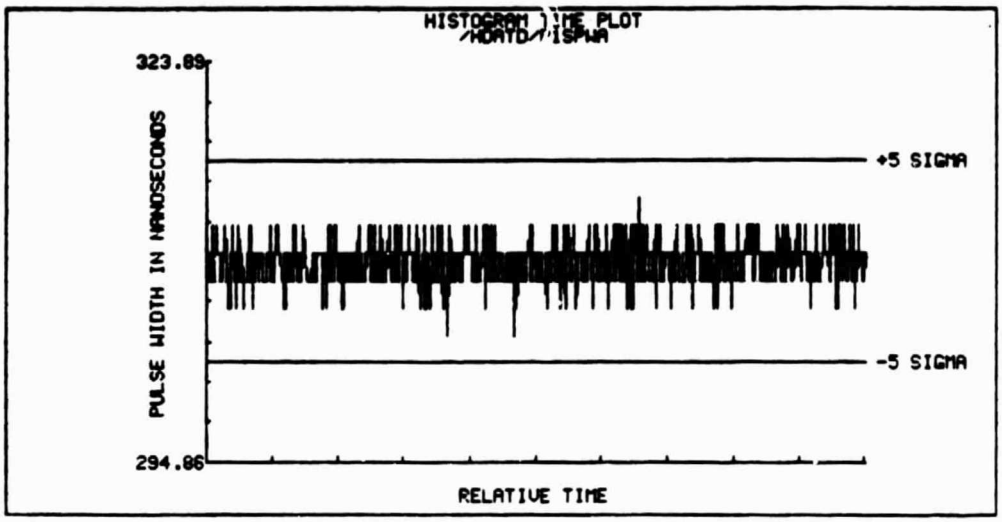
P1SPWD

Single Pulse Pulsewidth Sampled Data - P1SPWA

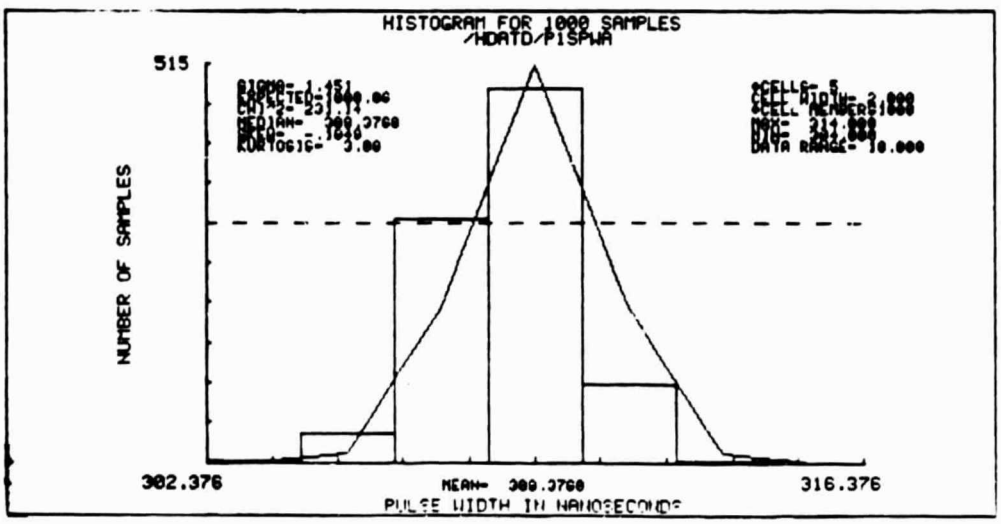
The statistical results of the single pulse pulsewidth sampled data P1SPWA are presented on the next three pages. Histogram time plots, histograms, and statistical analysis are presented.

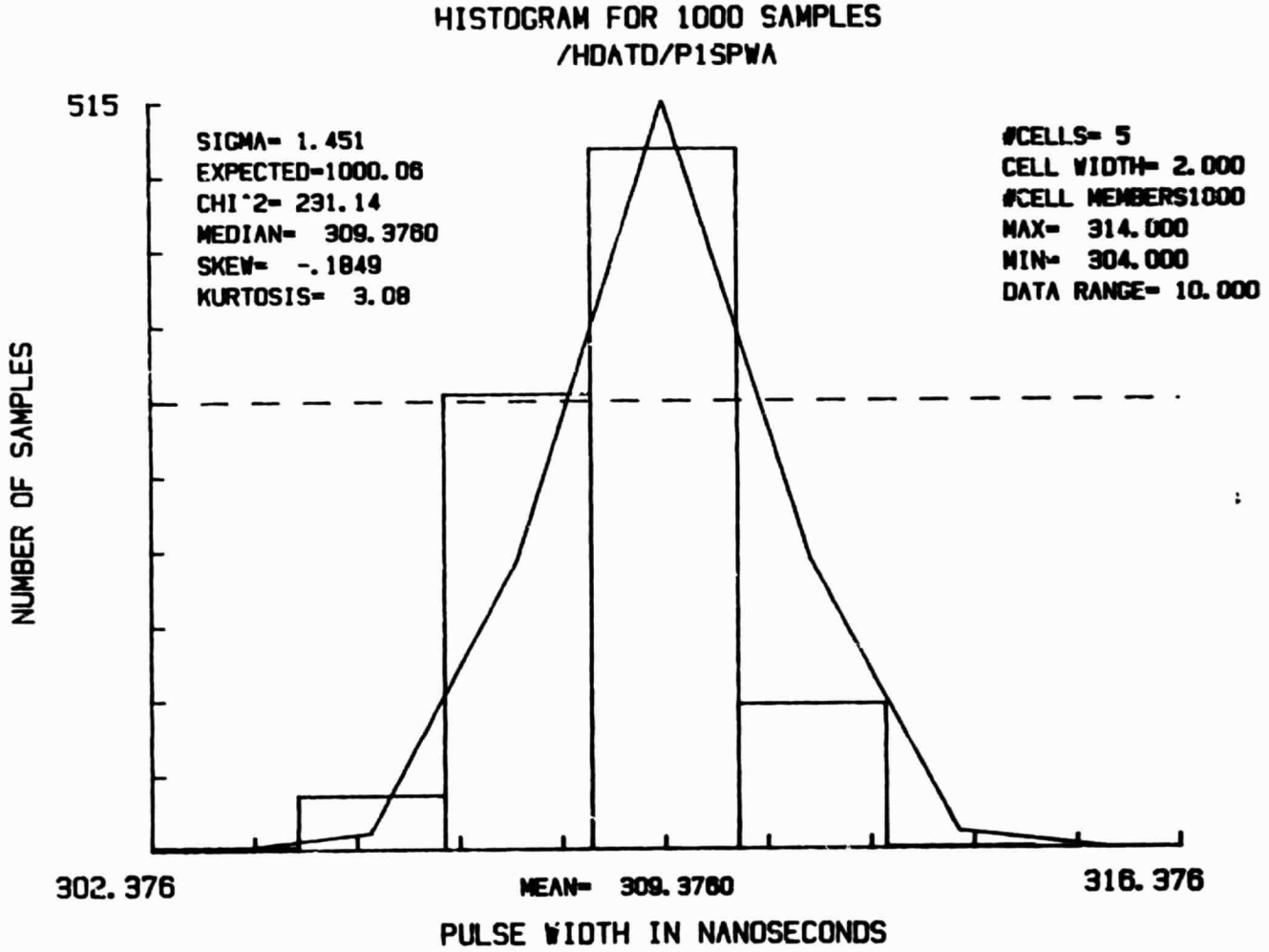
The test results section of this report contains summary statistical information associated with this pulsewidth data set.

FILENAME/HDATD/PISPWA START TIME IS16:14:4985/09/15
MEAN= 309.3760
MAX VALUE= 314.0000 MIN VALUE= 304.0000 RANGE= 10.00
SIGMA= 1.4514
COEFFICENT OF SKEWNESS= -.1849
COEFFICIENT OF KURTOSIS= 3.0815
OUT-OF-RANGE DATA POINTS= 0 POINTS



IF N1= 5 CW= 2
IF N1= 7 CW= 1.42857142857143
IF N1= 9 CW= 1.11111111111111
IF N1= 11 CW= .909090909090909
IF N1= 13 CW= .769230769230769
IF N1= 15 CW= .666666666666667
IF N1= 17 CW= .588235294117647
IF N1= 19 CW= .526315789473684
IF N1= 21 CW= .476190476190476
IF N1= 23 CW= .434782608695652
IF N1= 25 CW= .4
IF N1= 27 CW= .370370370370037
HPLOT EXECUTION TIME= 4.28MINUTES.




HISTOGRAM FOR 1000 SAMPLES
/HDATD/P1SPWA
515
SIGMA= 1.451
EXPECTED=1000.06
CHI^2= 231.14
MEDIAN= 309.3760
SKEW= -.1849
KURTOSIS= 3.08
#CELLS= 5
CELL WIDTH= 2.000
#CELL MEMBERS1000
MAX= 314.000
MIN= 304.000
DATA RANGE= 10.000
NUMBER OF SAMPLES
302.376
MEAN= 309.3760
316.376
PULSE WIDTH IN NANOSECONDS

FILE /HDATD/P1SPWA

PLOT MIN= 302.3760 PLOT MAX= 316.3760
DATA MIN= 304.0000 DATA MAX= 314.0000

CELL #	CENTER	# SAMPLES	EXPECTED
1	303.3760	2	.107
2	305.3760	40	12.328
3	307.3760	335	212.732
4	309.3760	515	549.726
5	311.3760	107	212.732
6	313.3760	1	12.328
7	315.3760	0	.107

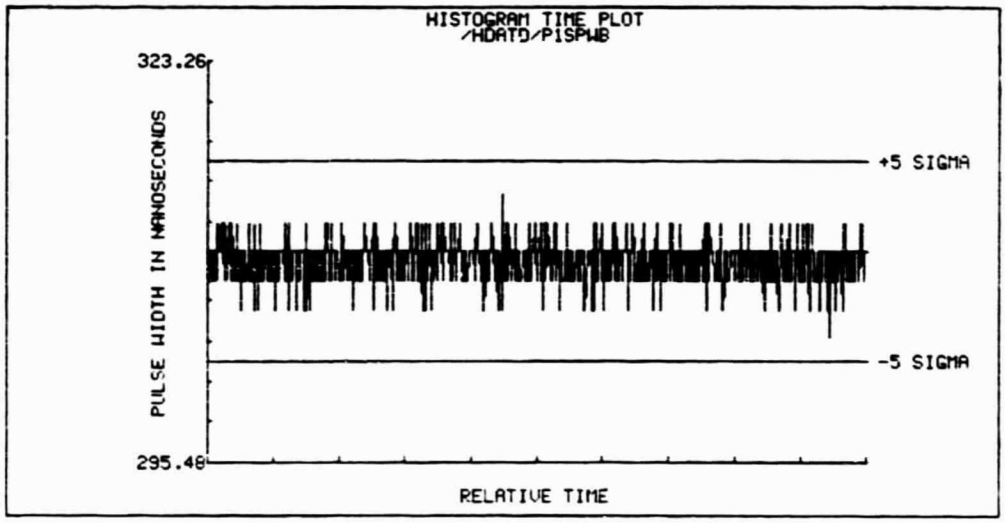
MEAN VALUE= 309.3760
STANDARD DEVIATION= 1.4514
COEFF OF SKEWNESS= -.1849
COEFF OF KURTOSIS= 3.0815
CHI-SQUARED= 231.1428
MEDIAN X VALUE= 309.3760
CELL WIDTH= 2.000000
PLOT RANGE=14.0000
SUM ACTUAL=1000
SUM EXPECTED=1000.0608
85.1PERCENT OF DATA LIES BETWEEN 307.3760 AND 305.3760

Single Pulse Pulsewidth Sampled Data - P1SPWB

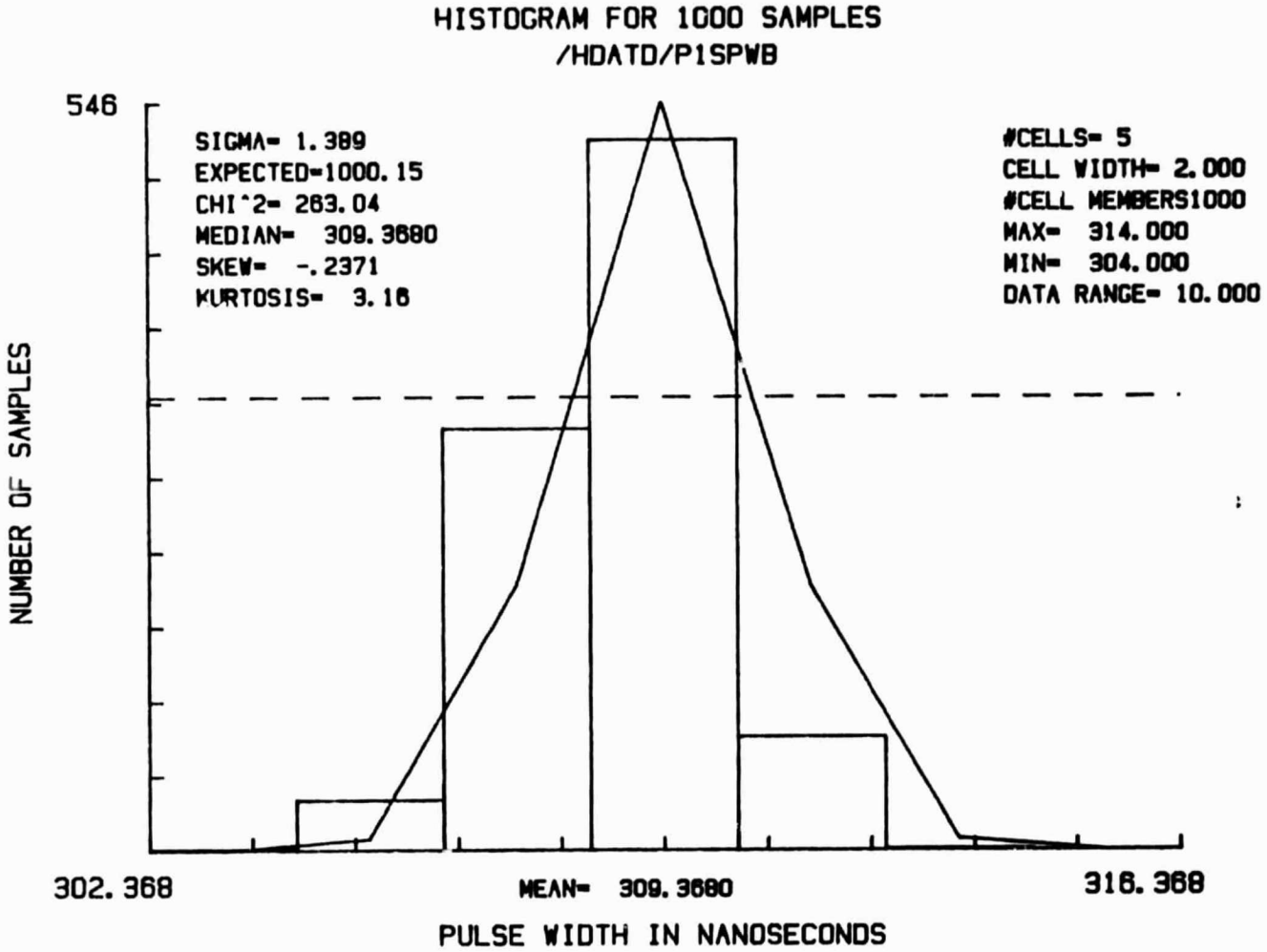
The statistical results of the single pulse pulsewidth sampled data P1SPWB are presented on the next three pages. Histogram time plots, histograms, and statistical analysis are presented.

The test results section of this report contains summary statistical information associated with this pulsewidth data set.

FILENAME/HDATD/P1SPWB START TIME IS16:25:2785/09/15
MEAN= 309.3680
MAX VALUE= 314.0000 MIN VALUE= 304.0000 RANGE= 10.00
SIGMA= 1.3887
COEFFICENT OF SKEWNESS= -.2371
COEFFICIENT OF KURTOSIS= 3.1611
OUT-OF-RANGE DATA POINTS= 0 POINTS



IF N1= 5 CW= 2
IF N1= 7 CW= 1.42857142857143
IF N1= 9 CW= 1.11111111111111
IF N1= 11 CW= .909090909090909
IF N1= 13 CW= .769230769230769
IF N1= 15 CW= .666666666666667
IF N1= 17 CW= .588235294117647
IF N1= 19 CW= .526315789473684
IF N1= 21 CW= .476190476190476
IF N1= 23 CW= .434782608695652
IF N1= 25 CW= .4
IF N1= 27 CW= .37037037037037


HISTOGRAM FOR 1000 SAMPLES
/HDATD/P1SPWB
546
SIGMA= 1.389
EXPECTED=1000.15
CHI^2= 263.04
MEDIAN= 309.3680
SKEW= -.2371
KURTOSIS= 3.16
#CELLS= 5
CELL WIDTH= 2.000
#CELL MEMBERS1000
MAX= 314.000
MIN= 304.000
DATA RANGE= 10.000
NUMBER OF SAMPLES
302.368
MEAN= 309.3680
316.368
PULSE WIDTH IN NANOSECONDS

FILE /HDATD/P1SPWB

PLOT MIN= 302.3680 PLOT MAX= 316.3680
DATA MIN= 304.0000 DATA MAX= 314.0000

CELL #	CENTER	# SAMPLES	EXPECTED
1	303.3680	1	.051
2	305.3680	39	9.074
3	307.3680	325	203.678
4	309.3680	546	574.542
5	311.3680	88	203.678
6	313.3680	1	9.074
7	315.3680	0	.051

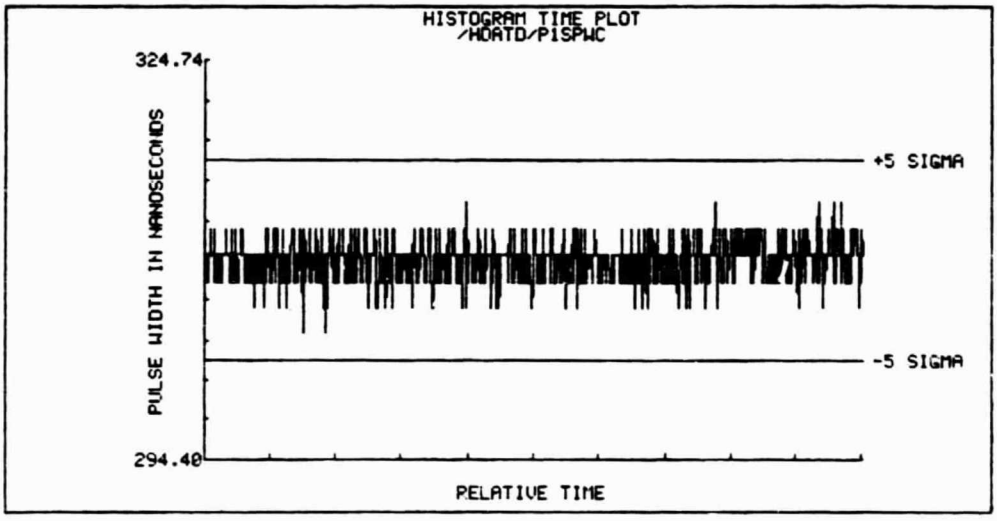
MEAN VALUE= 309.3680
STANDARD DEVIATION= 1.3887
COEFF OF SKEWNESS= -.2371
COEFF OF KURTOSIS= 3.1611
CHI-SQUARED= 263.0442
MEDIAN X VALUE= 309.3680
CELL WIDTH= 2.000000
PLOT RANGE=14.0000
SUM ACTUAL=1000
SUM EXPECTED=1000.1471
87.2PERCENT OF DATA LIES BETWEEN 307.3680 AND 309.3680

Single Pulse Pulsewidth Sampled Data - P1SPWC

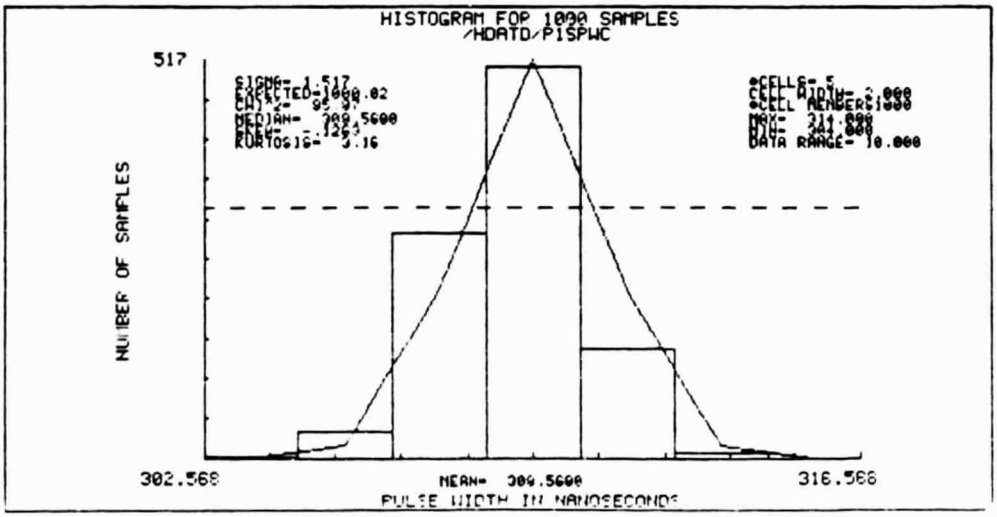
The statistical results of the single pulse pulsewidth sampled data P1SPWC are presented on the next three pages. Histogram time plots, histograms, and statistical analysis are presented.

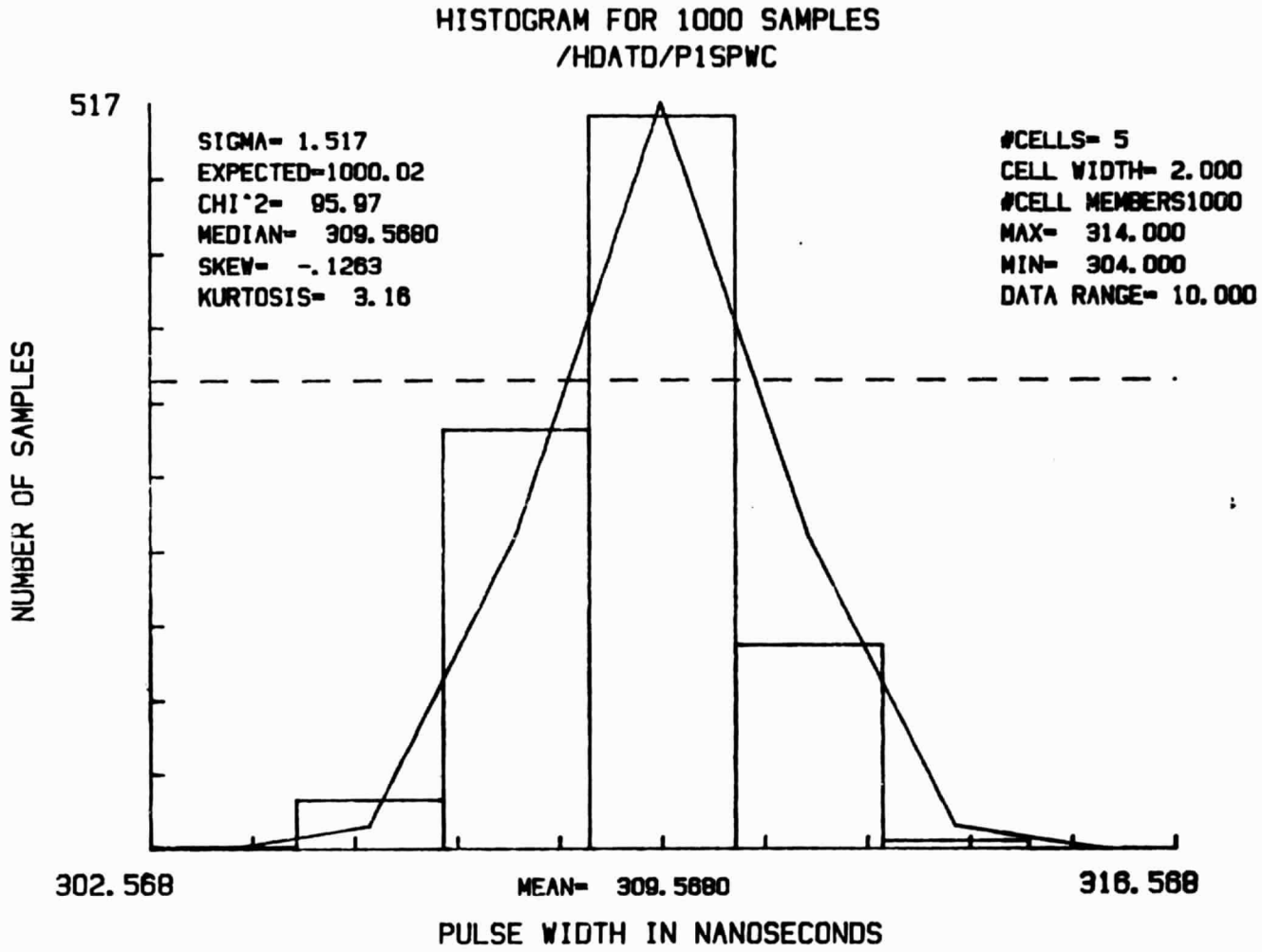
The test results section of this report contains summary statistical information associated with this pulsewidth data set.

FILENAME/HDATD/PISPWC START TIME IS16:35:1885/09/15
MEAN= 309.5680
MAX VALUE= 314.0000 MIN VALUE= 304.0000 RANGE= 10.00
SIGMA= 1.5170
COEFFICIENT OF SKEWNESS= -.1263
COEFFICIENT OF KURTOSIS= 3.1634
OUT-OF-RANGE DATA POINTS= 0 POINTS



IF N1= 5 CW= 2
IF N1= 7 CW= 1.42857142857143
IF N1= 9 CW= 1.11111111111111
IF N1= 11 CW= .909090909090909
IF N1= 13 CW= .769230769230769
IF N1= 15 CW= .666666666666667
IF N1= 17 CW= .588235294117647
IF N1= 19 CW= .526315789473684
IF N1= 21 CW= .476190476190476
IF N1= 23 CW= .434782608695652
IF N1= 25 CW= .4
IF N1= 27 CW= .37037037037037
HPLOT EXECUTION TIME= 4.20MINUTES.




HISTOGRAM FOR 1000 SAMPLES
/HDATD/P1SPWC
517
SIGMA= 1.517
EXPECTED=1000.02
CHI^2= 95.97
MEDIAN= 309.5680
SKEW= -.1263
KURTOSIS= 3.16
#CELLS= 5
CELL WIDTH= 2.000
#CELL MEMBERS1000
MAX= 314.000
MIN= 304.000
DATA RANGE= 10.000
NUMBER OF SAMPLES
302.568
MEAN= 309.5680
316.568
PULSE WIDTH IN NANOSECONDS

FILE /HDATD/P1SPWC

PLOT MIN= 302.5680 PLOT MAX= 316.5680
DATA MIN= 304.0000 DATA MAX= 314.0000

CELL #	CENTER	# SAMPLES	EXPECTED
1	303.5680	2	.211
2	305.5680	35	16.265
3	307.5680	296	220.559
4	309.5680	517	525.952
5	311.5680	144	220.559
6	313.5680	6	16.265
7	315.5680	0	.211

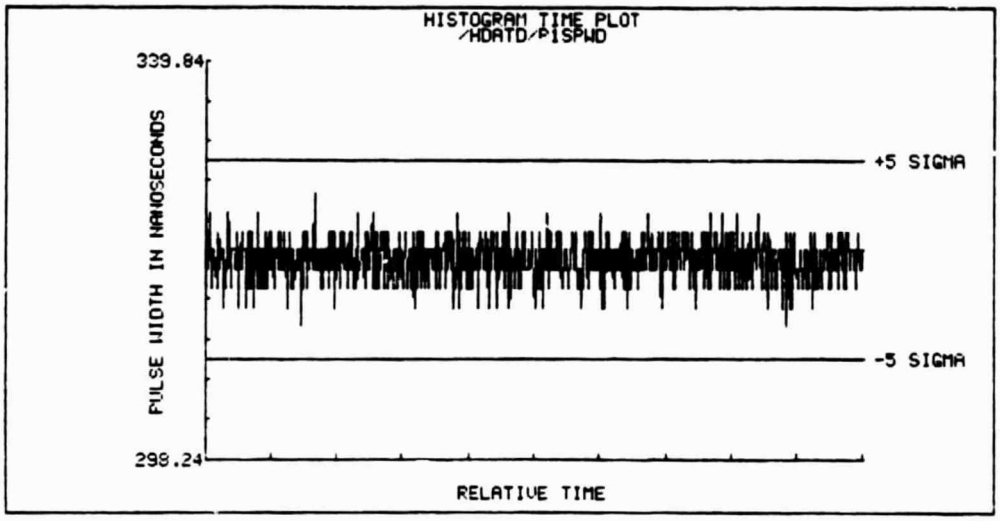
MEAN VALUE= 309.5680
STANDARD DEVIATION= 1.5170
COEFF OF SKEWNESS= -.1263
COEFF OF KURTOSIS= 3.1634
CHI-SQUARED= 95.9740
MEDIAN X VALUE= 309.5680
CELL WIDTH= 2.000000
PLOT RANGE=14.0000
SUM ACTUAL=1000
SUM EXPECTED=1000.0224
81.8PERCENT OF DATA LIES BETWEEN 307.5680 AND 309.5680

Single Pulse Pulsewidth Sampled Data - P1SPWD

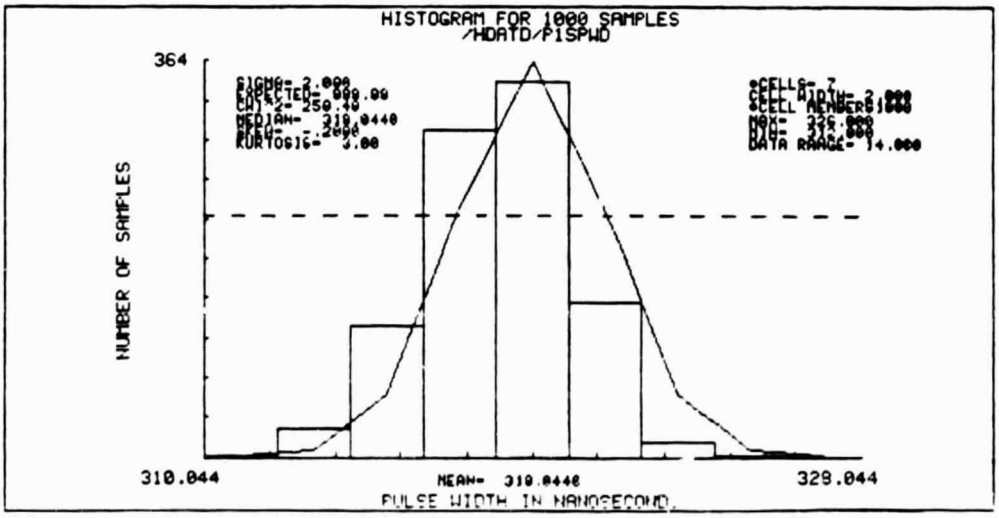
The statistical results of the single pulse pulsewidth sampled data P1SPWD are presented on the next three pages. Histogram time plots, histograms, and statistical analysis are presented.

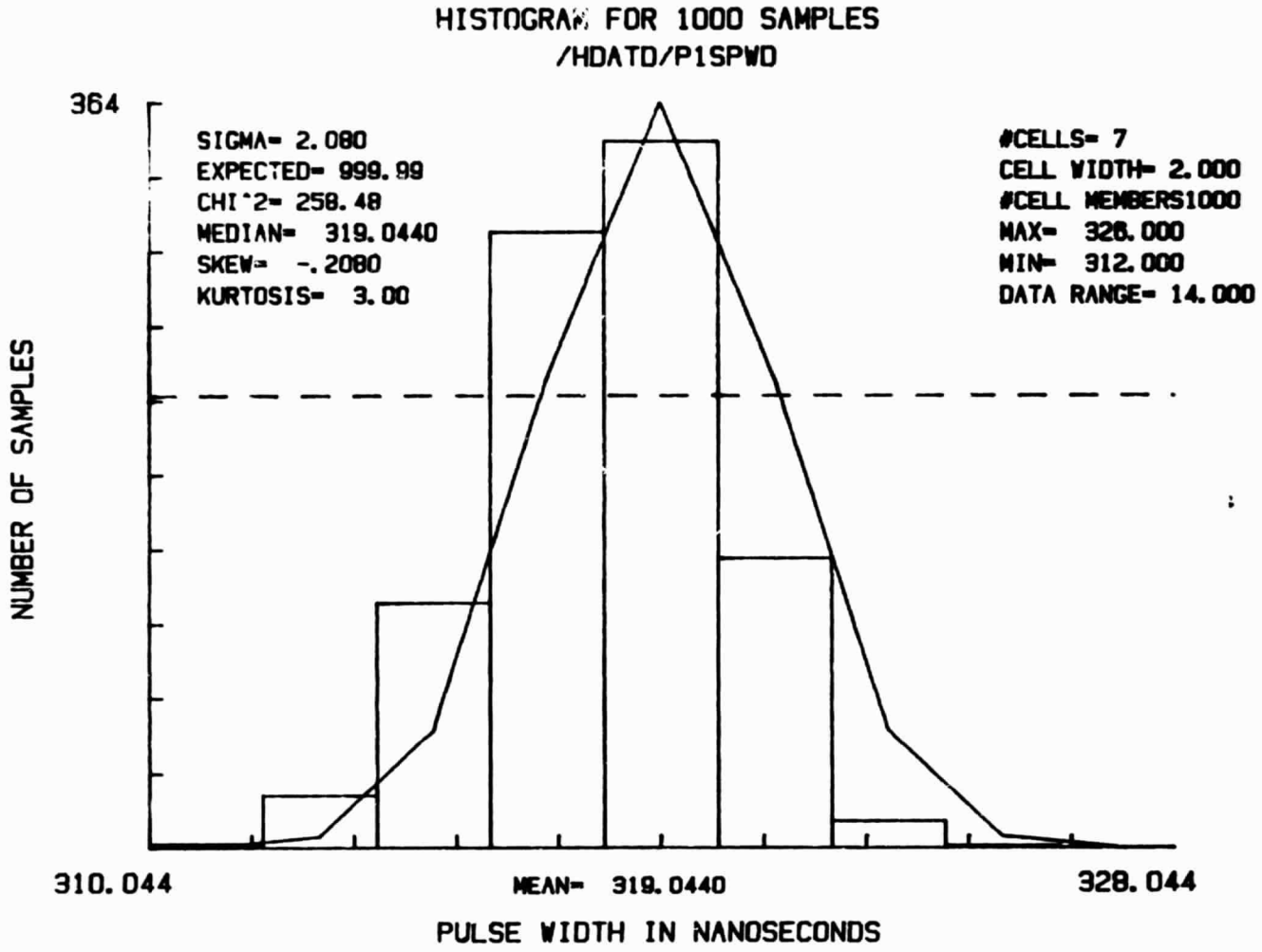
The test results section of this report contains summary statistical information associated with this pulsewidth data set.

FILENAME/HDATD/P1SPWD START TIME IS16:42:3285/09/15
MEAN= 319.0440
MAX VALUE= 326.0000 MIN VALUE= 312.0000 RANGE= 14.00
SIGMA= 2.0799
COEFFICENT OF SKEWNESS= -.2080
COEFFICIENT OF KURTOSIS= 2.9956
OUT-OF-RANGE DATA POINTS= 0 POINTS



IF N1= 5 CW= 2.8
IF N1= 7 CW= 2
IF N1= 9 CW= 1.55555555555556
IF N1= 11 CW= 1.27272727272727
IF N1= 13 CW= 1.07692307692308
IF N1= 15 CW= .933333333333333
IF N1= 17 CW= .823529411764706
IF N1= 19 CW= .736842105263158
IF N1= 21 CW= .666666666666667
IF N1= 23 CW= .608695652173913
IF N1= 25 CW= .56
IF N1= 27 CW= .518518518518518
HPLOT EXECUTION TIME= 5.70MINUTES,




HISTOGRAM FOR 1000 SAMPLES
/HDATD/P1SPWD
364
SIGMA= 2.080
EXPECTED= 999.99
CHI^2= 258.48
MEDIAN= 319.0440
SKEW= -.2080
KURTOSIS= 3.00
#CELLS= 7
CELL WIDTH= 2.000
#CELL MEMBERS1000
MAX= 326.000
MIN= 312.000
DATA RANGE= 14.000
NUMBER OF SAMPLES
310.044
MEAN= 319.0440
328.044
PULSE WIDTH IN NANOSECONDS

FILE /HDATD/P1SPWD

PLOT MIN= 310.0440 PLOT MAX= 328.0440
DATA MIN= 312.0000 DATA MAX= 326.0000

CELL #	CENTER	# SAMPLES	EXPECTED
1	311.0440	2	.235
2	313.0440	27	5.982
3	315.0440	126	60.363
4	317.0440	317	241.609
5	319.0440	364	383.613
6	321.0440	149	241.609
7	323.0440	14	60.363
8	325.0440	1	5.982
9	327.0440	0	.235

MEAN VALUE= 319.0440
STANDARD DEVIATION= 2.0799
COEFF OF SKEWNESS= -.2080
COEFF OF KURTOSIS= 2.9956
CHI-SQUARED= 258.4754
MEDIAN X VALUE= 319.0440
CELL WIDTH= 2.000000
PLOT RANGE=18.0000
SUM ACTUAL=1000
SUM EXPECTED= 999.9926
68.2PERCENT OF DATA LIES BETWEEN 317.0440 AND 319.0440